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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

February 2002

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored :Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT :15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction).
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction).
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
C6KY3	ALL	P	SUR	23	0	0	0.8	-4.2	4.3
C6LU3	ALL	P	SUR	49	0	0	0.9	7.4	7.5
C6QK	ALL	P	SUR	27	0	0	1.9	6.8	7.1
ELXZ7	ALL	P	SUR	32	0	0	1.6	-4.6	4.9
LAMV4	ALL	P	SUR	34	13	38	2.7	-1.3	3.0
MVLA7	ALL	P	SUR	31	0	0	1.7	5.5	5.8
P3FZ6	ALL	P	SUR	34	0	0	1.1	6.0	6.1
P3YR5	ALL	P	SUR	35	0	0	1.4	7.1	7.2
SIWN	ALL	P	SUR	30	0	0	3.7	4.0	5.4
UBAU	ALL	P	SUR	67	2	3	1.4	-4.5	4.7
UCTR	ALL	P	SUR	33	4	12	6.7	-2.9	7.3
UDUR	ALL	P	SUR	40	0	0	2.6	-5.7	6.3
UDYG	ALL	P	SUR	96	4	4	4.3	-4.3	6.1
UFNO	ALL	P	SUR	20	0	0	1.4	7.3	7.4
VTXL	ALL	P	SUR	23	0	0	2.0	4.6	5.0
VVKV	ALL	P	SUR	22	0	0	4.8	7.9	9.2
VVMA	ALL	P	SUR	49	0	0	1.6	4.1	4.4
V2PR	ALL	P	SUR	24	0	0	2.8	-4.8	5.5
V7BW9	ALL	P	SUR	45	0	0	0.8	-4.6	4.7
V7BX3	ALL	P	SUR	29	0	0	0.6	-4.1	4.2
WDCJ	ALL	P	SUR	59	0	0	5.2	5.2	7.4
WRYE	ALL	P	SUR	45	1	2	1.3	-4.9	5.0
62114	ALL	P	SUR	58	0	0	3.7	-4.9	6.1
62402	ALL	P	SUR	41	0	0	1.4	5.9	6.1
9MBW	ALL	P	SUR	53	0	0	2.0	-4.8	5.2
WIND SPEED									
DEOF	ALL	SPEED	SUR	20	0	0	3.4	5.3	6.3
DHDH	ALL	SPEED	SUR	22	0	0	3.9	5.0	6.3
DHPP	ALL	SPEED	SUR	21	0	0	3.4	5.1	6.1
DZSE	ALL	SPEED	SUR	34	0	0	3.6	7.2	8.1
ELKI8	ALL	SPEED	SUR	33	1	3	6.7	5.3	8.6
LAVX	ALL	SPEED	SUR	46	0	0	4.5	6.1	7.6
OVUN6	ALL	SPEED	SUR	74	0	0	6.4	5.9	8.7
OWFU2	ALL	SPEED	SUR	38	0	0	4.3	5.1	6.7
OWVI2	ALL	SPEED	SUR	41	0	0	5.1	5.9	7.8
OZWP2	ALL	SPEED	SUR	23	0	0	5.0	6.5	8.2
PPSO	ALL	SPEED	SUR	28	0	0	6.1	7.8	9.9
V2FA2	ALL	SPEED	SUR	51	0	0	2.9	5.5	6.2
ZCBE7	ALL	SPEED	SUR	37	0	0	4.7	5.4	7.1
ZCBU8	ALL	SPEED	SUR	30	0	0	3.2	5.2	6.1
ZQVV8	ALL	SPEED	SUR	21	3	14	8.6	-6.0	10.5
44145	ALL	SPEED	SUR	219	0	0	4.4	5.5	7.1
WIND DIRECTION									
BBXX KS0	ALL	DIRN.	SUR	118	2	2	89.1	27.0	93.1
DACF	ALL	DIRN.	SUR	207	0	0	95.7	5.7	95.9
KS004	ALL	DIRN.	SUR	30	0	0	58.1	42.5	71.9
KS012	ALL	DIRN.	SUR	68	3	4	104.0	44.3	113.1
OWFU2	ALL	DIRN.	SUR	33	0	0	15.8	-30.3	34.1
P3BA7	ALL	DIRN.	SUR	21	0	0	72.1	-40.8	82.8
UCTR	ALL	DIRN.	SUR	27	0	0	84.1	12.4	85.0
43001	ALL	DIRN.	SUR	56	0	0	14.4	36.3	39.1
46061	ALL	DIRN.	SUR	932	0	0	25.4	-34.9	43.2
52007	ALL	DIRN.	SUR	50	0	0	30.8	-63.0	70.1
62106	ALL	DIRN.	SUR	472	34	7	38.1	36.1	52.5
62131	ALL	DIRN.	SUR	67	0	0	14.3	33.8	36.7

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
SEA SURFACE TEMPERATURE									
CG2960	ALL	SST	SUR	232	65	28	1.9	0.0	1.9
C6HS4	ALL	SST	SUR	35	2	6	2.7	3.1	4.1
C6IO9	ALL	SST	SUR	25	0	0	2.8	-3.7	4.7
C6MS4	ALL	SST	SUR	42	1	2	1.6	-3.6	3.9
C6Q09	ALL	SST	SUR	21	0	0	0.6	3.6	3.6
ELJQ2	ALL	SST	SUR	29	0	0	1.6	4.3	4.6
ELWT7	ALL	SST	SUR	616	72	12	2.5	3.4	4.2
H3QM	ALL	SST	SUR	42	11	26	1.8	-0.3	1.8
H9GW	ALL	SST	SUR	30	0	0	0.6	4.8	4.8
H9RS	ALL	SST	SUR	54	0	0	1.3	3.8	4.0
JADY	ALL	SST	SUR	61	0	0	1.1	4.7	4.9
KGJX	ALL	SST	SUR	24	0	0	1.9	3.0	3.6
KRPB	ALL	SST	SUR	39	0	0	1.3	-3.3	3.6
KS005	ALL	SST	SUR	49	0	0	0.9	-7.7	7.8
LAJV4	ALL	SST	SUR	38	0	0	1.4	3.0	3.3
OIRT	ALL	SST	SUR	27	0	0	0.5	3.0	3.1
PDYV	ALL	SST	SUR	34	0	0	1.5	-3.4	3.8
PECF	ALL	SST	SUR	47	0	0	1.6	-3.3	3.6
PJOX	ALL	SST	SUR	85	1	1	0.7	-4.1	4.2
SHIPCB	ALL	SST	SUR	39	0	0	2.1	3.4	4.0
SHIPEU	ALL	SST	SUR	32	9	28	1.0	0.6	1.1
TSMS	ALL	SST	SUR	67	0	0	1.3	-4.1	4.3
UCNJ	ALL	SST	SUR	40	11	27	1.8	-0.1	1.8
UHCK	ALL	SST	SUR	26	0	0	0.9	-4.3	4.4
VCLM	ALL	SST	SUR	314	117	37	1.7	1.3	2.2
VOCJ	ALL	SST	SUR	143	15	10	2.5	4.7	5.3
WZJD	ALL	SST	SUR	48	0	0	0.6	-3.9	3.9
YJQL3	ALL	SST	SUR	28	0	0	1.0	-5.1	5.2
ZCBE7	ALL	SST	SUR	31	9	29	3.8	0.0	3.8
23091	ALL	SST	SUR	69	1	1	0.7	-3.4	3.5
3FDZ5	ALL	SST	SUR	32	0	0	1.1	3.9	4.0
44004	ALL	SST	SUR	642	0	0	0.8	4.4	4.4
46131	ALL	SST	SUR	534	534	100			
46146	ALL	SST	SUR	632	632	100			
46181	ALL	SST	SUR	412	412	100			

Figure 1. SHIP/SYNOP mean daily count. FEBRUARY 2002
Main hours only
Global average number of observations in 24 hours = 21192

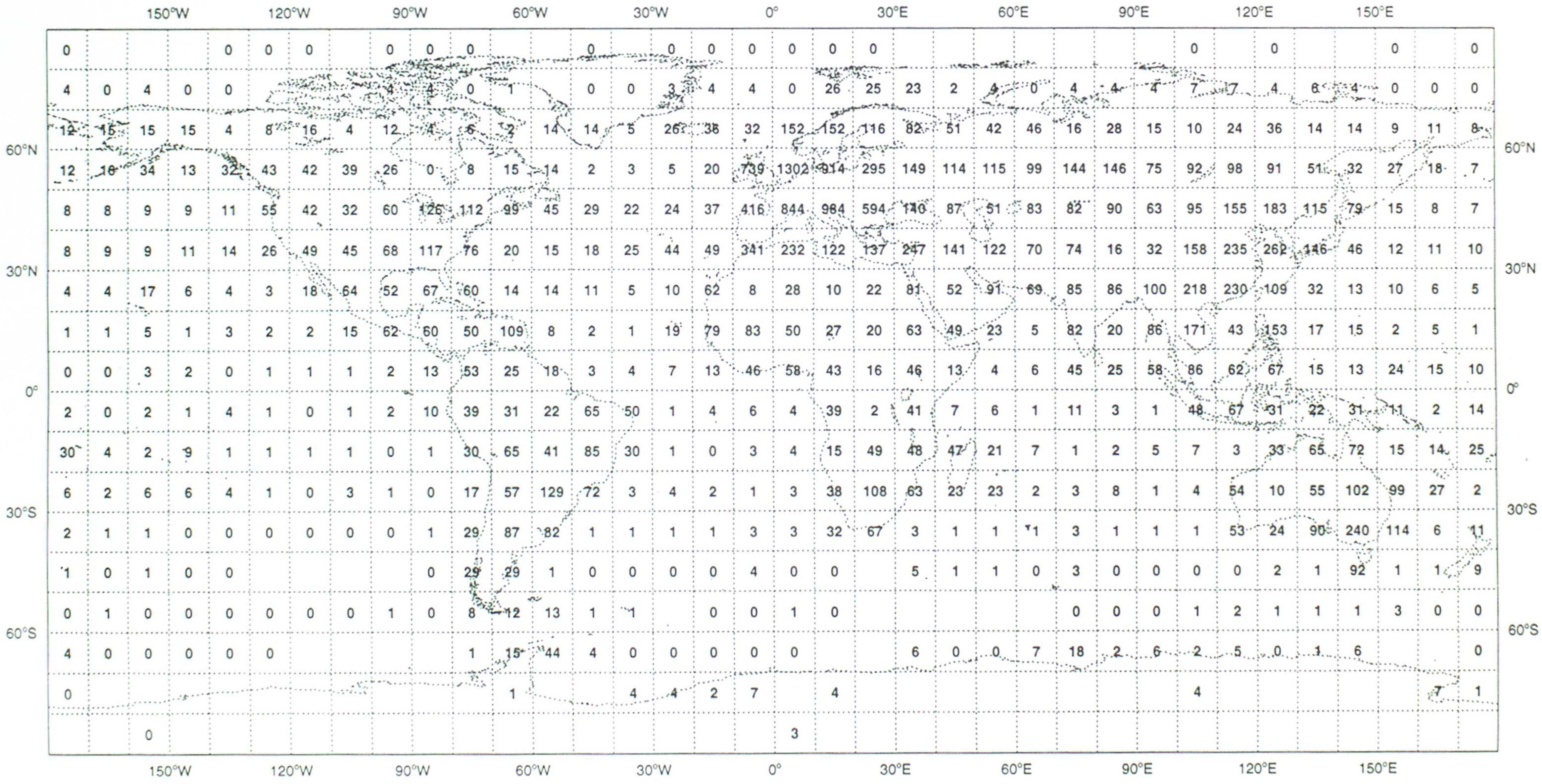

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
4 0 4 0 0 4 4 0 1 0 0 3 4 4 0 26 25 23 2 4 0 4 4 4 7 7 4 6 4 0 0 0
12 15 15 15 4 8 16 4 12 4 6 2 14 14 5 26 38 32 152 152 116 82 51 42 46 16 28 15 10 24 36 14 14 9 11 8
12 16 34 13 32 43 42 39 26 0 8 15 14 2 3 5 20 739 1302 914 295 149 114 115 99 144 146 75 92 98 91 51 32 27 18 7
8 8 9 9 11 55 42 32 60 126 112 99 45 29 22 24 37 416 844 984 594 140 87 51 83 82 90 63 95 155 183 115 79 15 8 7
8 9 9 11 14 26 49 45 68 117 76 20 15 18 25 44 49 341 232 122 137 247 141 122 70 74 16 32 158 235 262 146 46 12 11 10
4 4 17 6 4 3 18 64 52 67 60 14 14 11 5 10 62 8 28 10 22 81 52 91 69 85 86 100 218 230 109 32 13 10 6 5
1 1 5 1 3 2 2 15 62 60 50 109 8 2 1 19 79 83 50 27 20 63 49 23 5 82 20 86 171 43 153 17 15 2 5 1
0 0 3 2 0 1 1 1 2 13 53 25 18 3 4 7 13 46 58 43 16 46 13 4 6 45 25 58 86 62 67 15 13 24 15 10
2 0 2 1 4 1 0 1 2 10 39 31 22 65 50 1 4 6 4 39 2 41 7 6 1 11 3 1 48 67 31 22 31 11 2 14
30 4 2 9 1 1 1 1 0 1 30 65 41 85 30 1 0 3 4 15 49 48 47 21 7 1 2 5 7 3 33 65 72 15 14 25
6 2 6 6 4 1 0 3 1 0 17 57 129 72 3 4 2 1 3 38 108 63 23 23 2 3 8 1 4 54 10 55 102 99 27 2
2 1 1 0 0 0 0 0 0 1 29 87 82 1 1 1 1 3 3 32 67 3 1 1 1 3 1 1 1 53 24 90 240 114 6 11
1 0 1 0 0 0 29 29 1 0 0 0 0 4 0 0 5 1 1 0 3 0 0 0 0 2 1 92 1 1 9
0 1 0 0 0 0 0 0 1 0 8 12 13 1 1 0 0 1 0 0 0 0 1 2 1 1 1 3 0 0
4 0 0 0 0 0 1 15 44 4 0 0 0 0 0 6 0 0 7 18 2 6 2 5 0 1 6 0
0 1 4 4 2 7 4 4 7 1
0 3
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures			
Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from UKMO global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the wind observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
	:10 degrees	(sea surface temperature)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
25541	82.5	108.5	ALL	P	SUR	631	417	66	4.2	-10.3	11.1
44513	38.2	-70.2	ALL	P	SUR	353	134	38	7.0	-4.6	8.4
44515	38.8	-65.4	ALL	P	SUR	361	121	34	7.2	-3.2	7.8
44516	38.0	-72.8	ALL	P	SUR	348	123	35	6.0	-3.0	6.7
44517	40.2	-69.1	ALL	P	SUR	403	207	51	5.9	-6.2	8.5
52644	19.2	128.8	ALL	P	SUR	542	157	29	5.5	-3.6	6.6
54903	-55.8	-67.5	ALL	P	SUR	481	317	66	1.1	-0.2	1.2
61654	42.2	40.7	ALL	P	SUR	309	166	54	8.1	-0.9	8.2
WIND SPEED											
46700	50.9	-141.0	ALL	SPEED	SUR	66	0	0	3.1	-5.1	5.9
52526	14.7	126.4	ALL	SPEED	SUR	80	0	0	1.7	-5.7	6.0
52537	17.8	147.9	ALL	SPEED	SUR	537	0	0	2.6	-5.8	6.4
WIND DIRECTION											
41523	30.1	-45.1	ALL	DIRN.	SUR	116	8	7	75.5	-31.6	81.9
SEA SURFACE TEMPERATURE											
17548	-30.8	101.2	ALL	SST	SUR	22	6	27	3.1	-0.2	3.1
21644	46.3	-165.1	ALL	SST	SUR	264	263	100			
22512	35.4	158.5	ALL	SST	SUR	114	2	2	0.9	4.1	4.2
31913	1.5	-28.1	ALL	SST	SUR	234	0	0	0.5	3.9	3.9
33502	-32.2	-24.3	ALL	SST	SUR	97	0	0	0.3	4.4	4.4
46553	55.4	-171.6	ALL	SST	SUR	20	12	60	0.4	2.7	2.7
46972	25.2	-126.3	ALL	SST	SUR	184	0	0	0.2	3.3	3.3
53524	-8.1	115.4	ALL	SST	SUR	29	0	0	2.1	-3.2	3.8
54903	-55.8	-67.5	ALL	SST	SUR	497	329	66	1.2	1.0	1.6
55905	-48.5	-160.8	ALL	SST	SUR	632	0	0	0.3	3.5	3.5
55911	-54.6	-142.4	ALL	SST	SUR	477	0	0	0.5	4.0	4.1
61658	44.5	28.9	ALL	SST	SUR	173	34	20	1.1	7.5	7.6
62694	54.1	-28.3	ALL	SST	SUR	172	172	100			
62695	56.0	-17.1	ALL	SST	SUR	197	197	100			

Figure 2. DRIFTER mean daily count. FEBRUARY 2002
Main hours only
Global average number of observations in 24 hours = 9455

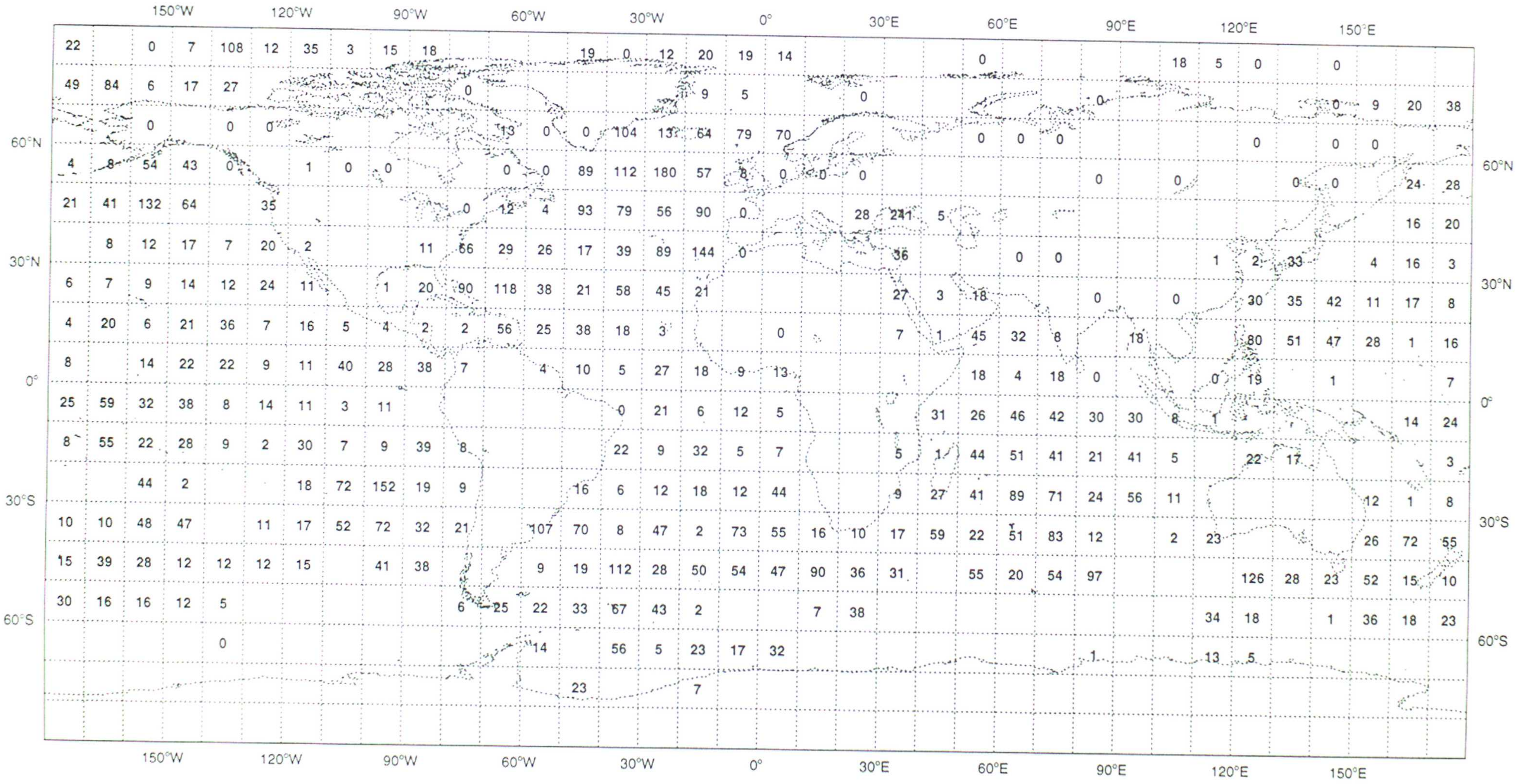

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
22 0 7 108 12 35 3 15 18 19 0 12 20 19 14 0 18 5 0 0
49 84 6 17 27 0 9 5 0 0 0 9 20 38
0 0 0 13 0 0 104 13 64 79 70 0 0 0 0 0 0
4 8 54 43 0 1 0 0 0 0 89 112 180 57 8 0 0 0 0 0 0 0 24 28
21 41 132 64 35 0 12 4 93 79 56 90 0 28 241 5 16 20
8 12 17 7 20 2 11 66 29 26 17 39 89 144 0 36 0 0 1 2 33 4 16 3
6 7 9 14 12 24 11 1 20 90 118 38 21 58 45 21 27 3 18 0 0 30 35 42 11 17 8
4 20 6 21 36 7 16 5 4 2 2 56 25 38 18 3 0 7 1 45 32 8 18 80 51 47 28 1 16
8 14 22 22 9 11 40 28 38 7 4 10 5 27 18 9 13 18 4 18 0 0 19 1 7
25 59 32 38 8 14 11 3 11 0 21 6 12 5 31 26 46 42 30 30 8 1 14 24
8 55 22 28 9 2 30 7 9 39 8 22 9 32 5 7 5 1 44 51 41 21 41 5 22 17 3
44 2 18 72 152 19 9 16 6 12 18 12 44 9 27 41 89 71 24 56 11 12 1 8
10 10 48 47 11 17 52 72 32 21 107 70 8 47 2 73 55 16 10 17 59 22 51 83 12 2 23 26 72 55
15 39 28 12 12 12 15 41 38 9 19 112 28 50 54 47 90 36 31 55 20 54 97 126 28 23 52 15 10
30 16 16 12 5 6 25 22 33 67 43 2 7 38 34 18 1 36 18 23
0 14 56 5 23 17 32 1 13 5
23 7

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60437	36.3N	2.8E	981	S8	78	0	0	0	0.8	-7.1	7.1
60476	35.4N	7.2E	1116	S8	79	28	35	0	1.4	13.8	13.9
60728	36.4N	10.7E	1	MS	58	0	0	0	0.7	-8.3	8.3
61492	16.1N	13.5W	18	MS	73	1	1	0	1.4	4.6	4.8
62271	24.2N	23.3E	417	M	58	0	0	0	1.0	4.1	4.2
62790	12.1N	24.9E	674	MS	65	1	2	3	1.4	4.8	5.0
63160	10.4N	45.0E	9	M	22	0	0	5	1.7	4.5	4.8
63170	9.5N	44.1E	1326	M	20	0	0	0	0.5	7.9	7.9
63175	9.5N	45.6E	1032	M	20	0	0	0	1.2	7.6	7.7
63333	11.1N	39.7E	1903	MS	40	0	0	0	0.5	5.7	5.7
63334	10.3N	37.7E	2515	MS	40	0	0	0	1.0	10.7	10.7
63402	7.7N	36.8E	1725	S	41	0	0	0	1.1	8.3	8.4
63450	9.0N	38.8E	2354	MS	31	0	0	0	0.7	4.6	4.7
63471	9.6N	41.9E	1260	MS	41	0	0	0	0.5	11.3	11.3
63478	5.9N	43.6E	295	MS	37	0	0	0	0.9	5.9	6.0
63801	4.9S	29.6E	882	S8	21	0	0	0	1.1	8.4	8.5
65355	9.8N	1.1E	342	MS	102	3	3	1	0.8	-12.0	12.0
68030	18.5S	25.6E	1071	8	79	0	0	1	0.9	4.4	4.5
68038	20.5S	26.0E	903	8	81	0	0	1	1.5	4.2	4.5
68255	25.6S	27.2E	1151	S8	105	35	33	42	4.1	-1.1	4.2
68338	26.9S	24.6E	1234	S8	59	59	100	0			
68396	26.5S	31.3E	641	S8	47	0	0	0	1.0	5.3	5.4
68575	30.0S	30.0E	1175	S8	85	85	100	0			
68647	31.9S	26.9E	1098	S8	58	0	0	72	0.6	5.6	5.6

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23975	60.4N	88.4E	86	M	66	65	98	2	0.0	1.4	1.4
24688	63.3N	143.2E	741	MS	112	18	16	0	4.7	5.1	6.9
24962	60.9N	132.0E	146	MS	62	20	32	32	1.5	0.7	1.7
30554	54.5N	113.6E	995	MS	111	0	0	0	4.6	5.5	7.2
30967	49.9N	115.8E	623	MS	81	0	0	0	2.5	-7.5	7.9
36096	51.7N	94.5E	628	M	112	5	4	0	3.4	7.9	8.6
38933	37.8N	68.8E	429	MS	49	0	0	0	4.4	4.0	5.9
40726	36.8N	45.7E	1384	MS	100	1	1	1	1.3	4.0	4.2
40741	36.6N	61.2E	235	MS	98	1	1	0	1.4	-4.4	4.6
40757	35.6N	53.4E	1171	MS	101	0	0	0	1.3	4.5	4.7
41254	23.1N	57.7E	1755	S8	64	64	100	0			
41314	17.7N	54.0E	467	MS	108	0	0	1	1.0	4.0	4.1
41396	16.0N	48.9E	700	MS	49	0	0	0	0.9	7.3	7.4
41466	13.7N	44.1E	1402	8	54	0	0	0	0.7	-5.5	5.5
44212	50.0N	92.1E	940	MS	109	1	1	0	2.5	6.3	6.8
44265	46.1N	91.5E	1186	MS	108	1	1	1	1.3	4.0	4.2
44416	28.6N	81.6E	720	MS	63	3	5	0	1.2	4.1	4.3
47022	40.8N	128.2E	1200	S	85	0	0	1	1.1	5.0	5.1
47127	36.9N	127.0E	16	MS	112	1	1	0	0.8	-12.3	12.3
48920	8.7N	111.9E	3	MS	106	0	0	0	0.5	-4.9	4.9
51334	44.6N	82.9E	321	M	107	0	0	0	3.5	6.4	7.3
51379	44.0N	89.6E	794	M	106	0	0	0	2.6	6.2	6.7
51495	43.5N	91.6E	874	M	106	2	2	1	2.5	10.2	10.5
51818	37.6N	78.3E	1376	M	108	0	0	0	3.0	5.2	6.0
52378	41.4N	102.4E	960	M	108	0	0	2	1.7	4.0	4.3
52602	38.8N	93.4E	2734	S	111	0	0	0	1.6	-6.7	6.9
52866	36.6N	101.8E	2262	S	112	0	0	0	0.9	-4.9	5.0
52955	35.6N	100.8E	3201	S	111	0	0	0	0.8	12.0	12.0
56144	31.8N	98.6E	3184	S	110	0	0	0	1.2	-5.6	5.7
56146	31.6N	100.0E	339	S	112	112	100	0			
56385	29.5N	103.3E	3049	S	111	0	0	3	1.9	-5.8	6.1
56444	28.5N	98.9E	3488	S	112	75	67	54	0.8	13.6	13.6
56462	29.0N	101.5E	2994	S	110	0	0	0	1.9	8.7	8.9

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	43	0	0	2	1.4	-6.1	6.3
82181	2.0S	54.1W	146	MS	75	0	0	0	1.2	4.3	4.5
82353	3.2S	52.2W	74	MS	75	0	0	0	1.1	-4.3	4.4
82704	7.6S	72.7W	170	MS	72	0	0	0	1.6	-4.3	4.6
83235	12.4S	46.4W	604	MS	77	0	0	0	1.2	6.8	6.9
83319	14.7S	52.4W	315	MS	76	0	0	3	1.5	4.2	4.5
83332	14.1S	46.4W	826	MS	76	27	36	0	0.9	13.6	13.6
83531	18.6S	46.5W	940	MS	75	0	0	0	0.8	-6.8	6.8
83836	25.5S	50.6W	837	MS	79	0	0	0	0.7	-5.3	5.3
84377	3.8S	73.3W	125	MS	109	1	1	1	2.0	4.0	4.5
84425	5.9S	76.1W	179	MS	82	0	0	0	1.2	4.1	4.3
84455	6.5S	76.4W	281	MS	79	1	1	1	1.4	7.2	7.3
84472	7.1S	78.5W	2620	S	53	0	0	0	0.6	-6.0	6.0
84474	7.2S	76.7W	350	S	23	1	4	4	1.3	10.7	10.8
84686	13.6S	72.0W	3248	S	110	0	0	0	0.7	-4.1	4.2
84688	13.7S	73.4W	3444	S	46	0	0	0	1.0	-12.8	12.8
84720	14.9S	75.0W	567	MS	52	0	0	0	0.8	4.5	4.6
84782	18.1S	70.3W	468	MS	83	0	0	0	1.0	6.3	6.4
85140	14.3S	67.4W	140	MS	55	1	2	0	1.7	5.1	5.4
85141	14.5S	67.6W	204	MS	55	0	0	0	1.6	4.5	4.8
85264	18.5S	64.1W	1998	S	54	54	100	0			
85312	19.8S	63.9W	992	S	45	0	0	0	1.2	-10.3	10.4
85432	22.5S	68.9W	2320	S8	77	0	0	0	0.5	5.4	5.4
86065	22.7S	61.5W	220	M	70	0	0	0	1.5	4.2	4.5
88986	59.4S	27.3W	78	MS	412	412	100	18			

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71023	65.9N	89.5W	18	MS	112	112	100	0			
71094	66.6N	61.6W	393	MS	112	0	0	6	1.7	-4.2	4.5
71176	60.0N	64.2W	551	MS	112	0	0	31	1.6	-4.0	4.3
71177	57.1N	61.5W	834	MS	109	0	0	0	1.6	-4.3	4.6
71179	54.7N	58.4W	683	MS	112	0	0	26	2.2	-4.0	4.6
71381	48.6N	71.7W	113	S	42	4	10	60	6.0	-1.2	6.1
71506	66.9N	136.3W	720	MS	111	0	0	6	1.6	-5.0	5.2
71747	48.8N	91.6W	424	MS	112	0	0	0	0.6	4.1	4.1
72327	36.1N	86.7W	182	MS	111	0	0	0	0.6	4.2	4.2
72376	35.2N	111.8W	2192	M	110	0	0	0	3.5	4.1	5.4
76118	30.4N	109.7W	1040	MS	26	1	4	0	0.6	-11.0	11.0
76243	28.7N	100.5W	250	MS	82	0	0	13	2.4	4.3	4.9
76491	23.8N	99.1W	355	MS	95	0	0	1	1.6	4.5	4.8
76543	22.0N	98.8W	104	MS	32	0	0	3	1.4	9.2	9.3
76625	20.6N	100.4W	1813	MS	57	0	0	4	0.7	-9.4	9.4
76658	19.2N	103.7W	494	MS	45	0	0	0	0.7	5.1	5.1
76683	19.3N	98.2W	2248	MS	84	0	0	0	0.8	4.0	4.1
76743	18.0N	92.9W	10	MS	66	0	0	2	2.5	5.9	6.4
76855	15.7N	96.5W	43	MS	38	0	0	0	0.6	-5.2	5.2
76903	14.9N	92.3W	118	MS	82	0	0	0	0.8	6.2	6.3

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	30	0	0	0	0.6	10.9	10.9
95815	35.1S	144.0E	72	MS	112	0	0	0	2.9	7.5	8.0
96295	5.1S	105.2E	96	MS	26	0	0	4	2.4	4.1	4.8
96505	3.7N	115.7E	898	S8	21	19	90	5	3.2	3.3	4.6
97378	10.7S	123.1E	1	MS	30	30	100	0			

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
06685	47.0N	9.1E	515	MS	112	0	0	18	1.3	7.0	7.1
06716	46.2N	7.3E	737	S8	112	0	0	10	1.8	4.0	4.4
10557	50.5N	11.1E	845	S8	336	336	100	0			
11116	47.5N	10.8E	870	S	56	0	0	0	1.0	4.1	4.2
12140	54.4N	18.7E	2	MS	109	0	0	0	0.7	7.9	7.9
13269	44.3N	19.9E	176	MS	109	0	0	1	1.1	8.3	8.4
14554	44.9N	18.4E	140	S	55	1	2	2	1.2	-12.9	13.0
14650	43.8N	18.0E	972	S	56	0	0	0	0.8	5.0	5.1
17092	39.8N	39.5E	1218	S8	111	0	0	0	2.0	8.9	9.1
17203	38.9N	40.5E	1177	S8	111	0	0	0	1.2	9.4	9.5

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	62	1	2	5	2.3	-5.5	6.0
89263	66.0S	66.1W	20	M	193	0	0	0	1.4	10.5	10.6
89264	71.4S	68.9W	780	S	181	1	1	1	1.0	8.1	8.2
89266	72.2S	60.3W	91	S	192	172	90	0	8.8	-10.0	13.3
89272	74.8S	71.5W	1369	S	234	234	100	0			
89512	70.8S	11.8E	140	MS	110	1	1	0	1.1	-4.3	4.4
89612	66.3S	110.8E	390	S	229	229	100	0			
89637	69.9S	130.0E	2560	S	287	192	67	8	0.5	14.2	14.2
89661	73.1S	169.6E	200	S	66	0	0	0	1.9	6.2	6.5
89666	76.7S	163.0E	200	S	64	64	100	0			
89744	74.0S	43.0E	3353	S	262	0	0	0	0.6	7.1	7.1
89769	78.5S	168.4E	50	S	363	363	100	0			
89847	67.6S	146.0E	30	S	290	0	0	0	1.2	-8.0	8.1

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored		
	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	1793	0	44	1.9	0.3	1787	0	43	0	7.2	0.4
AAL	6090	1	33	1.6	0.0	6058	0	33	0	7.4	0.4
AAR	1280	0	5	2.1	-0.9	1294	0	4	0	7.6	0.2
ACA	3026	1	11	1.7	-0.2	3014	0	11	0	7.6	0.4
ACI	88	2	51	1.1	0.2	88	0	51	0	6.4	1.5
AEA	765	1	5	1.9	0.5	757	0	5	0	7.7	0.7
AEL	788	1	9	1.7	-0.9	784	0	9	0	7.4	0.4
AEY	275	1	4	2.1	1.2	276	1	4	0	7.2	0.4
AFL	514	1	4	1.7	0.5	510	0	5	0	7.5	1.0
AFR	1802	1	8	1.7	0.3	1817	0	8	0	7.2	0.6
AIC	20	0	15	2.9	0.0	21	0	14	0	10.6	-0.5
AIH	357	0	3	2.0	-0.4	348	0	4	0	8.5	1.1
AIS	24	0	13	1.5	0.6	24	4	17	0	9.0	1.9
AJM	202	0	3	1.5	-0.2	202	1	4	0	7.6	0.7
AMM	95	1	9	1.2	0.4	95	0	55	0	7.9	0.2
AMT	648	0	45	2.2	1.0	655	0	45	0	8.6	0.4
AMX	297	2	7	2.0	0.0	299	0	6	0	9.8	0.3
ANA	576	0	9	1.6	0.4	575	0	11	0	6.9	0.6
ANZ	4580	0	34	1.4	0.4	4554	0	34	0	7.5	1.0
AVA	270	1	3	1.9	0.6	273	0	1	0	7.4	0.9
AVE	169	5	8	1.5	0.7	167	1	7	0	9.1	1.4
AVN	99	0	46	0.8	0.2	97	0	46	0	5.3	0.6
AXF	58	0	28	1.8	0.4	56	0	29	0	10.1	0.8
AZA	613	1	6	1.9	-0.2	606	1	6	0	8.5	0.6
BAL	311	0	7	1.5	-0.1	301	0	8	0	7.5	0.4
BAW	912	0	7	1.8	-0.4	916	0	7	0	7.0	1.1
BLX	40	5	5	1.5	-0.7	42	0	5	0	8.9	-0.5
BWA	283	0	4	2.2	1.7	284	0	7	0	9.2	0.5
CAL	77	1	5	1.9	0.1	82	0	4	0	6.4	0.5
CCA	166	3	19	2.6	0.0	187	0	100	0	13.0	0.1
CES	269	1	7	2.0	0.1	283	0	6	0	7.8	0.2
CFC	29	0	7	1.8	0.5	29	0	7	0	7.0	0.1
CFG	1028	1	4	1.5	-0.5	1028	0	3	0	7.0	0.5
CKS	248	1	46	2.2	1.4	249	1	47	0	7.6	0.8
CLX	441	0	3	1.5	-0.6	449	0	4	0	6.4	0.3
CMI	39	0	18	1.3	-0.4	51	0	14	0	4.9	0.6
COA	869	1	44	1.6	-0.3	878	0	44	0	8.1	0.6
CPA	87	0	10	1.2	0.4	88	0	13	0	7.3	0.3
CRL	988	2	6	1.8	0.5	981	0	6	0	8.4	0.7
CSN	85	5	15	2.5	0.2	85	0	16	0	10.9	-0.5
CUB	185	1	6	2.4	1.2	188	0	5	0	9.7	-0.1
DAL	2735	1	40	1.6	-0.2	2744	0	40	0	8.3	0.0
DCE	187	2	8	1.3	0.5	191	0	8	0	6.9	0.3
DLH	1504	1	14	1.5	0.0	1512	0	14	0	7.2	1.0
EDW	75	3	8	1.3	-0.2	74	0	8	0	8.2	1.3
EEZ	151	2	10	1.6	0.8	146	0	14	0	9.2	1.4
EIA	300	1	12	2.1	0.3	300	0	100	0	16.0	3.0
EIN	31	0	6	2.3	-0.7	31	0	0	0	7.8	2.5
ELY	86	0	6	1.8	0.2	89	0	6	0	7.4	1.3
ETH	32	0	13	1.6	-0.4	36	0	14	0	5.6	-0.7
EVA	141	0	10	1.8	0.0	147	1	11	0	7.8	0.6
EWW	113	0	2	1.6	0.2	116	0	3	0	9.9	0.6
FDX	1807	1	46	1.6	0.3	1814	0	45	0	7.4	0.6
FIN	248	0	1	1.4	0.2	246	0	2	0	6.6	1.2
FJI	767	1	48	1.3	0.4	741	1	48	0	9.1	1.0
FOM	545	0	33	1.4	0.1	541	0	34	0	8.4	0.9
GAF	41	2	2	1.3	-0.6	41	0	0	0	4.7	1.1
GCO	143	1	7	1.9	-0.3	144	1	100	0	16.4	4.1
GHA	46	2	13	2.0	-0.7	47	0	17	0	13.2	-0.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GRL	25	0	0	1.4	-0.1	25	0	0	0	5.4	2.2
GTI	314	0	7	1.9	0.1	310	1	7	0	7.4	1.2
HAL	3505	1	39	1.8	-0.1	3473	0	39	0	9.4	0.7
IBE	2884	1	6	1.7	0.5	2835	0	8	0	8.0	0.7
ICE	826	0	2	1.6	0.0	766	0	3	0	7.0	0.8
IWD	32	0	3	2.0	-0.6	32	0	0	0	6.6	1.6
JAA	112	4	14	1.9	1.1	112	1	44	0	8.7	2.9
JAL	2369	0	4	1.7	0.2	2366	0	4	0	7.2	0.3
JAZ	856	0	3	1.8	0.8	858	0	4	0	7.3	0.6
JKK	84	0	2	1.6	0.0	74	0	8	0	10.2	1.2
KAL	2682	1	14	1.8	0.0	2691	0	14	0	7.8	0.4
KLM	2051	1	6	1.6	0.1	2057	0	6	0	7.9	0.9
LAN	109	5	72	2.6	1.1	119	0	100	0	9.5	1.0
LAP	101	3	45	2.2	1.0	101	0	43	0	8.0	-0.9
LDA	60	0	3	1.2	-0.2	59	0	3	0	5.9	1.3
LDI	583	2	42	2.5	0.2	590	0	4	0	8.1	0.3
LIB	1128	1	8	1.6	0.7	1131	0	7	0	6.8	0.7
LOT	123	1	6	2.2	-1.4	123	0	4	0	6.1	1.0
LTU	647	0	5	1.5	0.0	639	0	6	0	7.8	0.5
MAS	199	1	9	2.2	-0.3	205	0	7	0	9.0	0.0
MON	160	0	4	1.5	-0.1	160	0	5	0	8.0	1.3
MPD	204	0	5	1.6	-0.2	204	1	6	0	8.1	0.6
MPH	609	1	5	1.8	-0.6	618	0	5	0	8.0	0.4
NCA	723	0	5	2.0	0.1	712	0	4	0	6.8	0.6
NWA	8348	1	12	1.7	0.2	8337	0	13	0	8.2	0.4
NZL	3535	0	14	1.3	0.3	3535	0	14	0	5.9	0.8
OAE	206	0	41	1.5	-0.5	205	0	44	0	10.5	1.2
PAC	367	2	31	2.0	-0.1	365	1	31	0	7.6	0.5
PAL	1113	0	12	1.7	-0.3	1033	0	13	0	8.1	0.7
PAO	284	0	50	1.6	0.4	280	0	52	0	9.0	1.9
PUA	36	6	42	2.3	1.3	36	0	47	0	16.1	-1.8
QFA	2899	0	49	1.6	0.3	2900	0	49	0	7.1	0.9
RAF	32	0	0	1.6	1.5	32	0	0	0	5.6	1.0
RCH	609	1	100	2.8	-0.1	580	0	100	0	12.8	1.2
RJA	23	4	4	1.5	-0.3	24	0	0	0	6.8	1.2
RRR	27	7	11	1.1	0.2	27	0	15	0	16.4	2.2
RYN	184	0	43	1.9	0.8	184	0	45	0	11.3	-0.9
RZO	211	1	100	2.4	0.0	209	0	4	0	9.2	0.9
SAA	338	0	2	1.5	-0.5	338	0	3	0	7.2	1.2
SIA	234	0	2	1.6	0.4	240	0	3	0	6.9	0.2
SLR	218	1	11	1.4	0.3	217	0	12	0	9.2	-0.1
SQC	46	0	4	1.9	0.8	46	0	4	0	6.5	0.0
SVA	63	3	10	2.0	0.3	70	0	9	0	8.5	0.1
SWR	75	0	4	1.5	-0.2	78	0	5	0	8.4	2.2
TAM	29	17	38	2.7	1.4	30	0	100	0	18.0	1.9
TAP	518	0	2	1.6	-0.4	517	0	4	0	8.2	0.3
THA	128	0	5	1.9	0.1	133	0	7	0	8.8	0.9
THT	63	2	35	2.0	0.5	59	0	31	0	8.3	0.6
TPA	43	0	2	1.3	0.7	42	0	2	0	6.9	-2.1
TSC	31	0	0	1.1	-0.2	32	0	0	0	5.3	0.1
UAL	157414	0	100	1.4	-0.1	157322	0	100	0	5.3	0.7
UPS	1795	0	57	1.7	0.1	1801	0	57	0	7.8	0.6
USA	170	1	4	1.5	-0.1	157	0	4	0	7.9	0.5
VIR	405	0	3	1.7	-0.1	420	0	5	0	7.0	1.0
VPB	26	0	4	1.2	0.4	24	0	4	0	6.2	0.5
VRG	152	3	100	2.1	1.0	153	0	100	0	10.5	1.9
VVR	99	0	41	2.8	1.7	98	0	40	0	6.5	-0.1
WOA	294	1	6	1.6	0.5	313	0	12	0	9.2	1.1
YSS	32	3	3	1.1	0.8	32	0	0	0	6.4	1.8

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	36759	0	11	1.3	0.6	36767	0	11	0	5.5	0.6
EU	114451	0	33	1.4	0.2	114451	0	33	0	4.9	0.6
KL	2069	0	9	1.4	0.7	2050	0	9	0	5.8	1.4
LH	264	0	3	1.5	0.5	264	0	3	0	4.4	0.5
MK	5042	0	7	1.8	1.4	5015	0	8	0	7.7	2.1
RY	28	7	43	0.8	0.1	28	0	39	0	5.9	-1.3
SA	6293	0	64	2.1	1.7	6279	0	10	0	6.6	0.8
TN	61	2	34	2.0	0.5	61	0	34	0	7.7	1.3
WA	307	2	13	1.8	0.6	304	1	13	0	8.8	1.3
XX	4416	1	9	1.6	0.2	4409	0	10	0	9.6	1.1
N	712	1	27	2.2	0.4	730	0	26	0	8.4	0.5
US ACARS	780728	1	57	1.6	0.4	780718	0	57	0	5.5	0.9

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	310	1	27	1.5	0.3	310	0	27	0	8.9	1.5
AAR	23	0	9	1.1	0.0	23	0	9	0	7.9	2.9
ACI	24	0	58	1.8	0.4	26	0	58	0	15.3	3.4
AEY	23	0	4	1.2	0.6	24	0	8	0	7.1	-1.7
AFR	48	0	4	1.1	0.1	52	0	10	0	7.6	1.2
ANZ	166	2	27	1.9	-0.1	167	0	25	0	5.5	0.3
AXF	73	3	37	1.8	0.6	67	0	37	0	5.2	0.5
CFC	133	4	10	1.6	0.3	133	0	8	0	9.6	0.1
CFG	37	0	0	1.4	-0.9	37	0	0	0	4.5	0.7
COA	131	0	60	2.4	-0.9	136	1	57	0	7.3	1.5
CRL	37	0	8	1.3	0.1	34	0	9	0	8.3	0.5
CUB	37	0	3	2.3	1.2	39	0	5	0	8.0	1.1
DAF	20	5	5	2.2	-0.7	20	0	0	0	6.2	2.2
DAL	350	1	53	1.7	-0.1	348	0	54	0	8.1	0.6
DHL	53	6	58	5.5	-4.9	49	0	10	0	7.6	0.3
DLH	220	0	15	1.4	0.3	225	0	16	0	5.9	0.2
EIA	22	5	9	1.5	-0.1	22	0	100	0	16.7	0.8
EVA	22	0	41	2.3	-0.6	22	0	36	0	7.2	2.6
EWW	77	0	0	1.2	0.3	77	0	1	0	8.2	1.6
FDX	557	0	29	1.5	0.5	560	0	29	0	7.1	0.6
GAF	20	5	5	0.8	0.2	20	0	0	0	5.1	-0.4
GCO	363	0	3	1.7	-0.1	363	1	100	0	18.5	4.0
GHA	24	4	4	1.4	0.1	24	0	0	0	9.1	2.9
GTI	41	0	12	1.7	0.3	41	2	22	0	15.5	4.2
HAL	85	1	40	1.6	0.0	83	0	41	0	12.7	-0.6
IBE	63	3	16	1.6	0.7	63	0	17	0	8.7	2.5
ICE	28	0	7	2.8	-1.2	21	0	10	0	12.6	1.5
JAA	21	5	24	1.7	0.8	21	0	62	0	6.0	0.8
JAL	91	1	5	1.5	0.5	91	0	9	0	10.2	0.7
JAZ	140	1	6	1.7	0.5	142	0	6	0	7.4	1.3
KAL	36	0	31	2.1	0.0	36	0	25	0	8.6	-0.4
KIW	26	8	38	2.8	2.2	26	0	31	0	4.9	0.7
KLM	116	2	11	1.5	0.2	118	0	13	0	7.2	0.6
LAN	102	4	81	2.9	0.1	121	0	100	0	8.4	3.7
LIB	48	2	2	1.4	0.6	47	0	4	0	8.1	0.3
MAS	27	0	4	1.3	-0.4	27	4	7	0	5.1	1.9
MPH	54	0	7	1.6	-0.2	53	0	8	0	5.5	0.5
NCA	119	0	1	1.6	0.0	111	0	5	0	7.4	1.3
NWA	382	2	20	1.7	0.6	384	0	20	0	8.3	0.6
NZL	17577	0	57	1.4	0.4	17577	0	57	0	4.7	0.6
PAC	38	0	16	2.1	-0.9	38	0	16	0	7.3	-0.7
PAL	38	0	5	1.4	-0.6	39	0	10	0	8.8	0.8
QFA	205	3	44	2.0	0.5	210	1	43	0	7.5	0.9
RCH	140	3	100	3.8	-1.4	131	2	100	0	16.5	1.1
RRR	102	16	21	1.7	0.7	109	0	17	0	14.0	-0.9
SAA	42	5	7	1.8	-0.6	42	0	0	0	4.1	0.0
SIA	41	0	5	0.9	0.5	43	0	7	0	4.3	1.9
SKI	45	13	42	4.5	-2.5	31	0	35	0	18.0	1.0
UAL	279644	0	100	1.2	0.0	279104	0	100	0	4.5	0.2
UPS	127	0	43	1.2	0.3	129	0	44	0	10.7	-0.8
VTA	22	0	14	2.5	-1.5	23	0	4	0	5.1	2.5
VVP	38	5	58	4.3	0.0	38	0	61	0	14.0	3.6
WOA	30	0	7	2.1	-0.3	32	0	19	0	11.9	3.3
AU	31952	0	52	1.2	0.2	32006	0	53	0	4.4	0.4
EU	611424	0	71	1.1	0.2	608108	0	71	0	4.5	0.0
KL	1784	0	54	1.4	0.7	1781	0	53	0	4.4	0.4
LH	33	0	42	0.9	0.5	33	0	42	0	3.0	-0.2
MK	3777	0	53	1.5	0.8	3746	0	54	0	6.3	1.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SA	5423	0	79	1.8	0.7	5413	0	58	0	5.0	0.6
WA	91	8	12	1.8	0.6	89	1	9	0	10.4	0.0
XX	1298	3	9	1.5	0.0	1296	1	12	0	11.2	1.4
A	25	0	4	2.7	1.7	25	0	4	0	10.5	1.5
N	23	22	35	3.4	2.0	23	4	22	0	11.4	1.1
US ACARS	1652779	0	79	1.3	0.4	1647106	0	79	0	4.5	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 42550

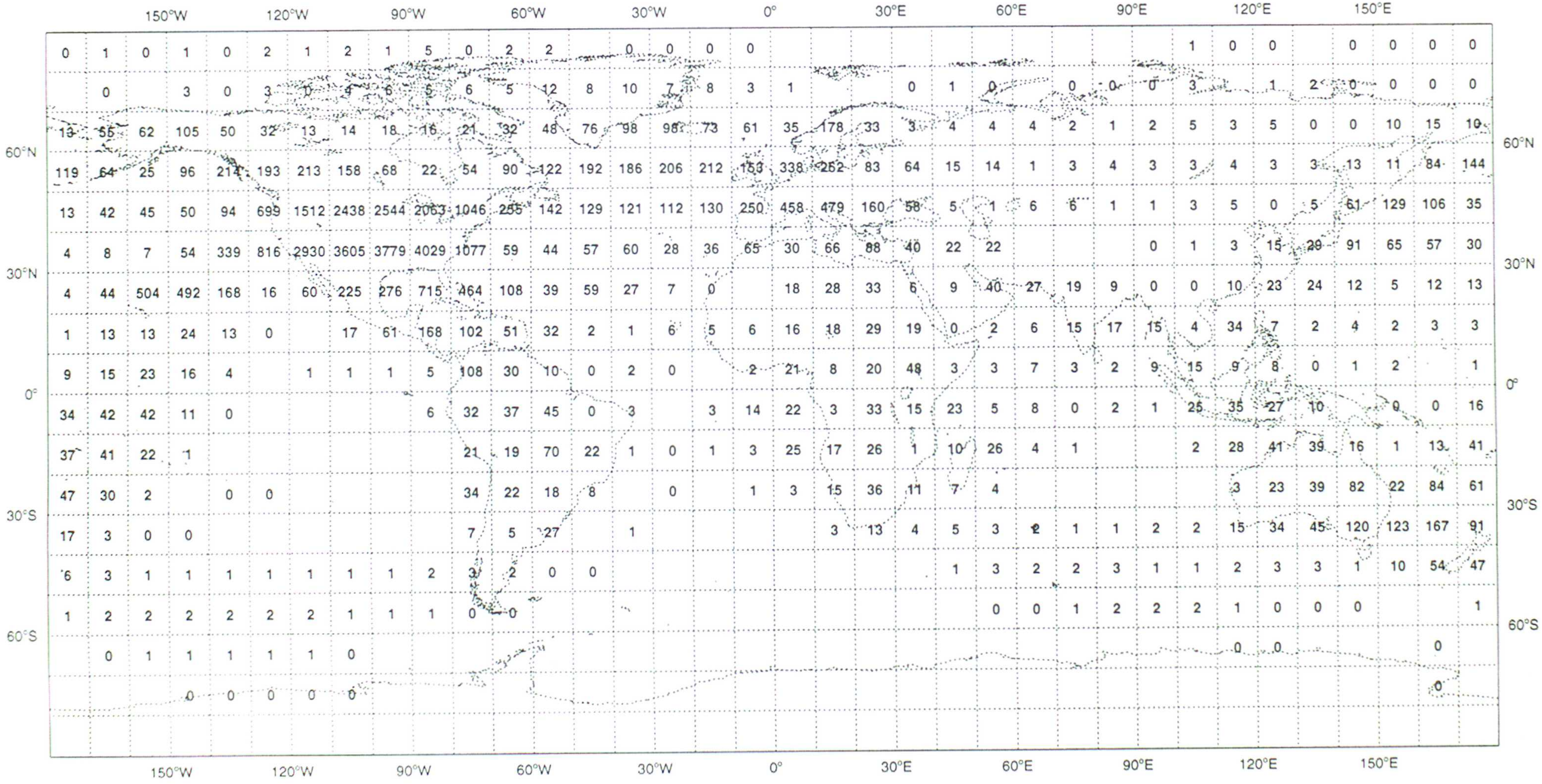

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 2 1 2 1 5 0 2 2 0 0 0 0 1 0 0 0 0 0 0
0 3 0 3 0 4 6 5 6 5 12 8 10 7 8 3 1 0 1 0 0 0 0 3 1 2 0 0 0 0
13 55 62 105 50 32 13 14 18 16 21 32 48 76 98 98 73 61 35 178 33 3 4 4 4 2 1 2 5 3 5 0 0 10 15 10
119 64 25 96 214 193 213 158 68 22 54 90 122 192 186 206 212 153 338 252 83 64 15 14 1 3 4 3 3 4 3 3 13 11 84 144
13 42 45 50 94 699 1512 2438 2544 2063 1046 255 142 129 121 112 130 250 458 479 160 58 5 1 6 6 1 1 3 5 0 5 61 129 106 35
4 8 7 54 339 816 2930 3605 3779 4029 1077 59 44 57 60 28 36 65 30 66 88 40 22 22 0 1 3 15 29 91 65 57 30
4 44 504 492 168 16 60 225 276 715 464 108 39 59 27 7 0 18 28 33 6 9 40 27 19 9 0 0 10 23 24 12 5 12 13
1 13 13 24 13 0 17 61 168 102 51 32 2 1 6 5 6 16 18 29 19 0 2 6 15 17 15 4 34 7 2 4 2 3 3
9 15 23 16 4 1 1 1 5 108 30 10 0 2 0 2 21 8 20 48 3 3 7 3 2 9 15 9 8 0 1 2 1
34 42 42 11 0 6 32 37 45 0 3 3 14 22 3 33 15 23 5 8 0 2 1 25 35 27 10 0 0 16
37 41 22 1 21 19 70 22 1 0 1 3 25 17 26 1 10 26 4 1 2 28 41 39 16 1 13 41
47 30 2 0 0 34 22 18 8 0 1 3 15 36 11 7 4 3 23 39 82 22 84 61
17 3 0 0 7 5 27 1 3 13 4 5 3 2 1 1 2 2 15 34 45 120 123 167 91
6 3 1 1 1 1 1 1 1 2 3 2 0 0 1 3 2 2 3 1 1 2 3 3 1 10 54 47
1 2 2 2 2 2 2 1 1 1 0 0 0 0 1 2 2 2 1 0 0 0 1
0 1 1 1 1 1 0 0 0 0
0 0 0 0 0 0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 92931

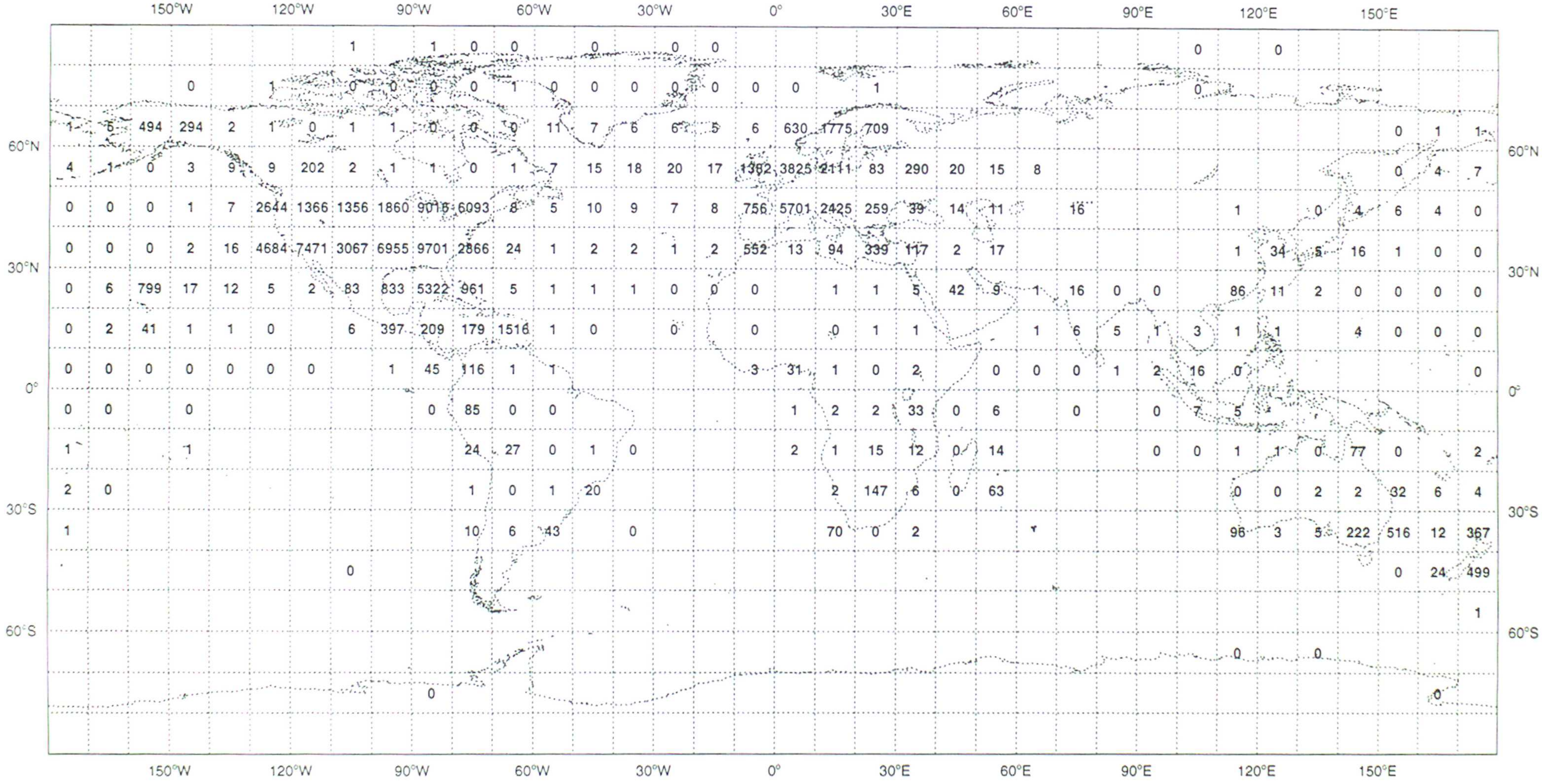

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1 1 0 0 0 0 0 0 0
0 1 0 0 0 0 1 0 0 0 0 0 0 0 1 0
1 5 494 294 2 1 0 1 1 0 0 0 11 7 6 6 5 6 630 1775 709 0 1 1
4 1 0 3 9 9 202 2 1 1 0 1 7 15 18 20 17 1362 3825 2111 83 290 20 15 8 0 4 7
0 0 0 1 7 2644 1366 1356 1860 9016 6093 8 5 10 9 7 8 756 5701 2425 259 39 14 11 16 1 0 4 6 4 0
0 0 0 2 16 4684 7471 3067 6955 9701 2866 24 1 2 2 1 2 552 13 94 339 117 2 17 1 34 5 16 1 0 0
0 6 799 17 12 5 2 83 833 5322 961 5 1 1 1 0 0 0 1 1 5 42 9 1 16 0 0 86 11 2 0 0 0 0
0 2 41 1 1 0 6 397 209 179 1516 1 0 0 0 0 1 1 1 6 5 1 3 1 1 4 0 0 0
0 0 0 0 0 0 0 1 45 116 1 1 3 31 1 0 2 0 0 0 1 2 16 0 0
0 0 0 0 85 0 0 1 2 2 33 0 6 0 0 7 5
1 1 24 27 0 1 0 2 1 15 12 0 14 0 0 1 1 0 77 0 2
2 0 1 0 1 20 2 147 6 0 63 0 0 2 2 32 6 4
1 10 6 43 0 70 0 2 96 3 5 222 516 12 367
0 0 24 499
1
0 0
0 0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

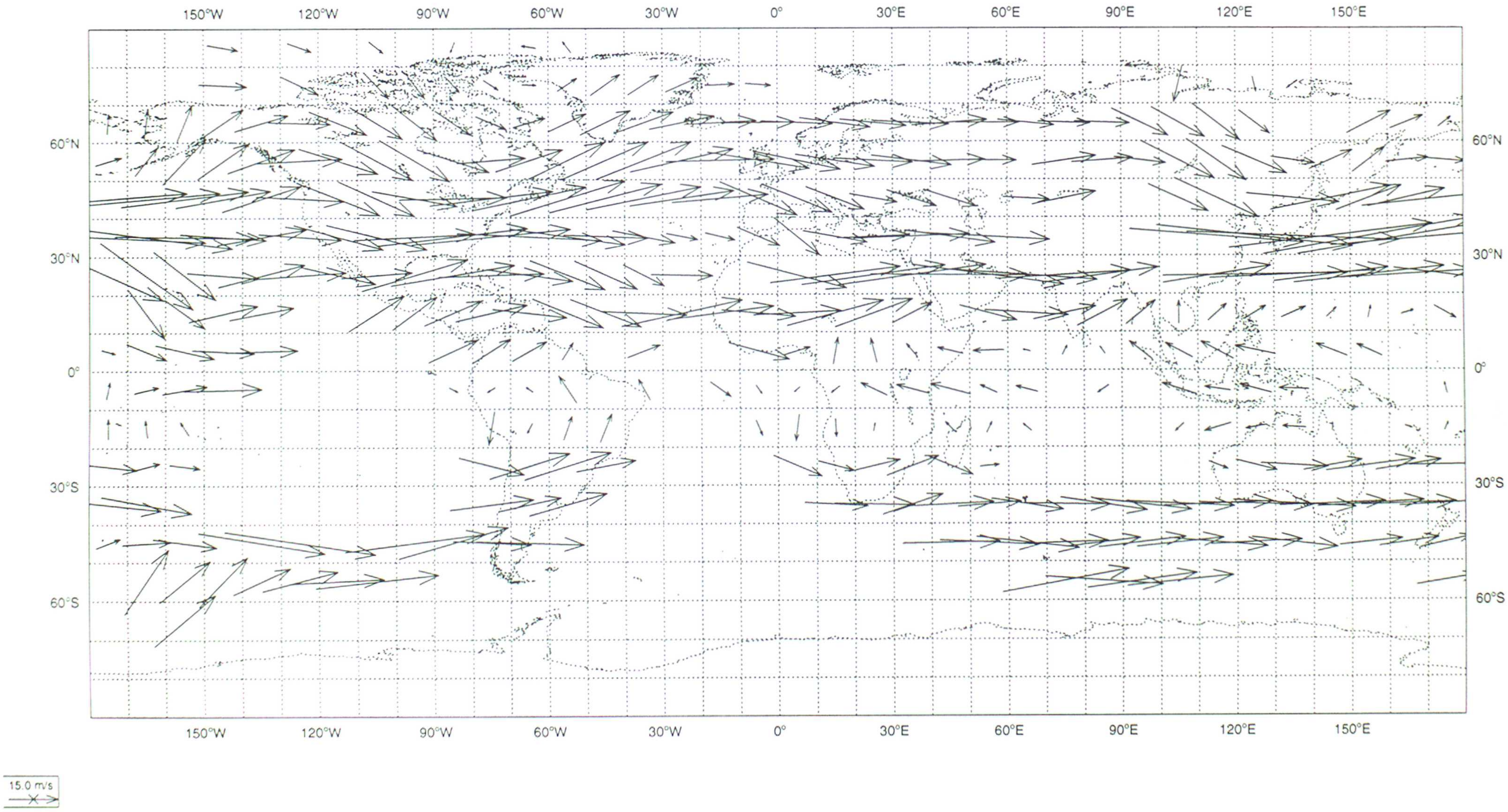

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

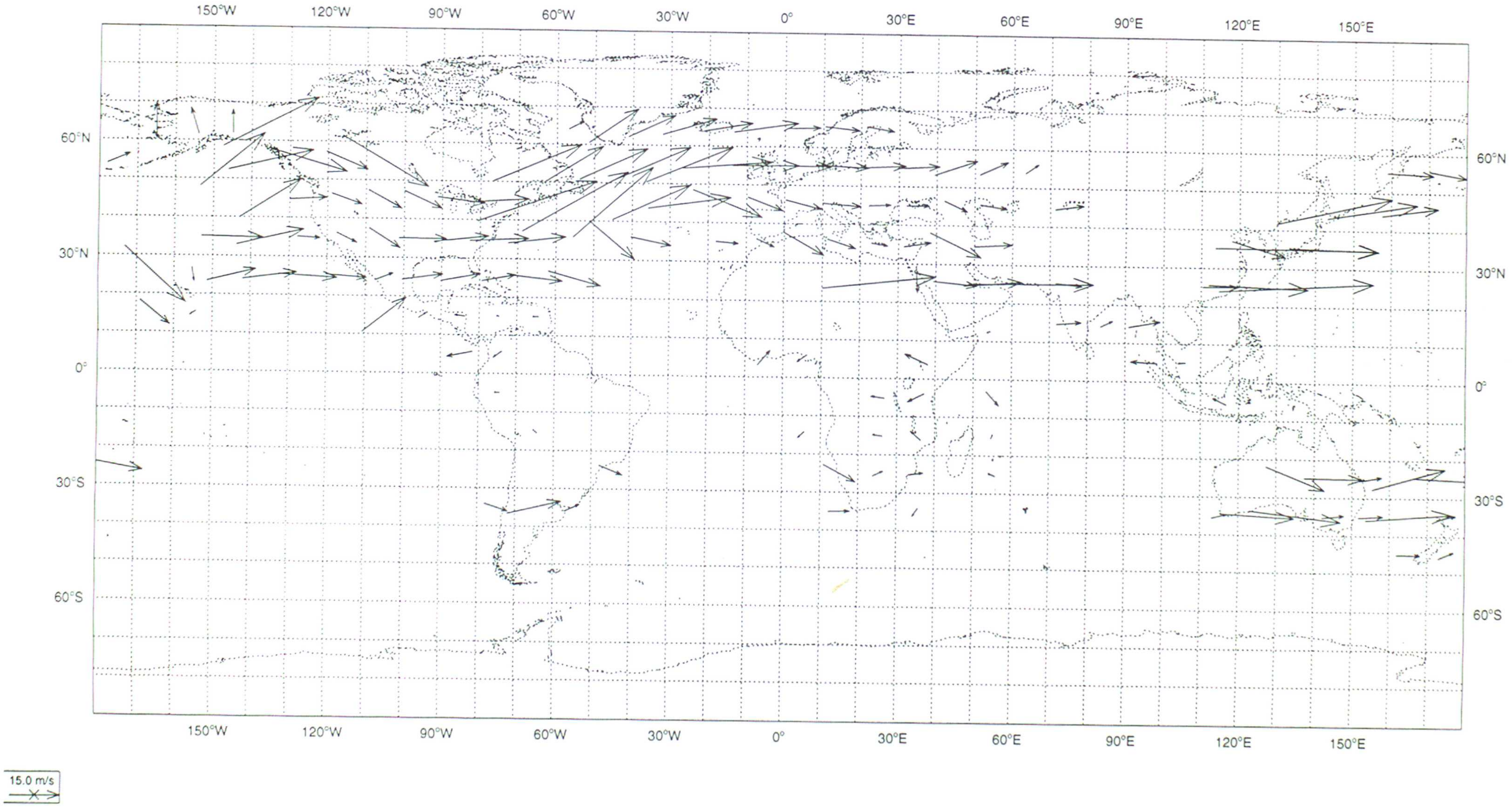

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

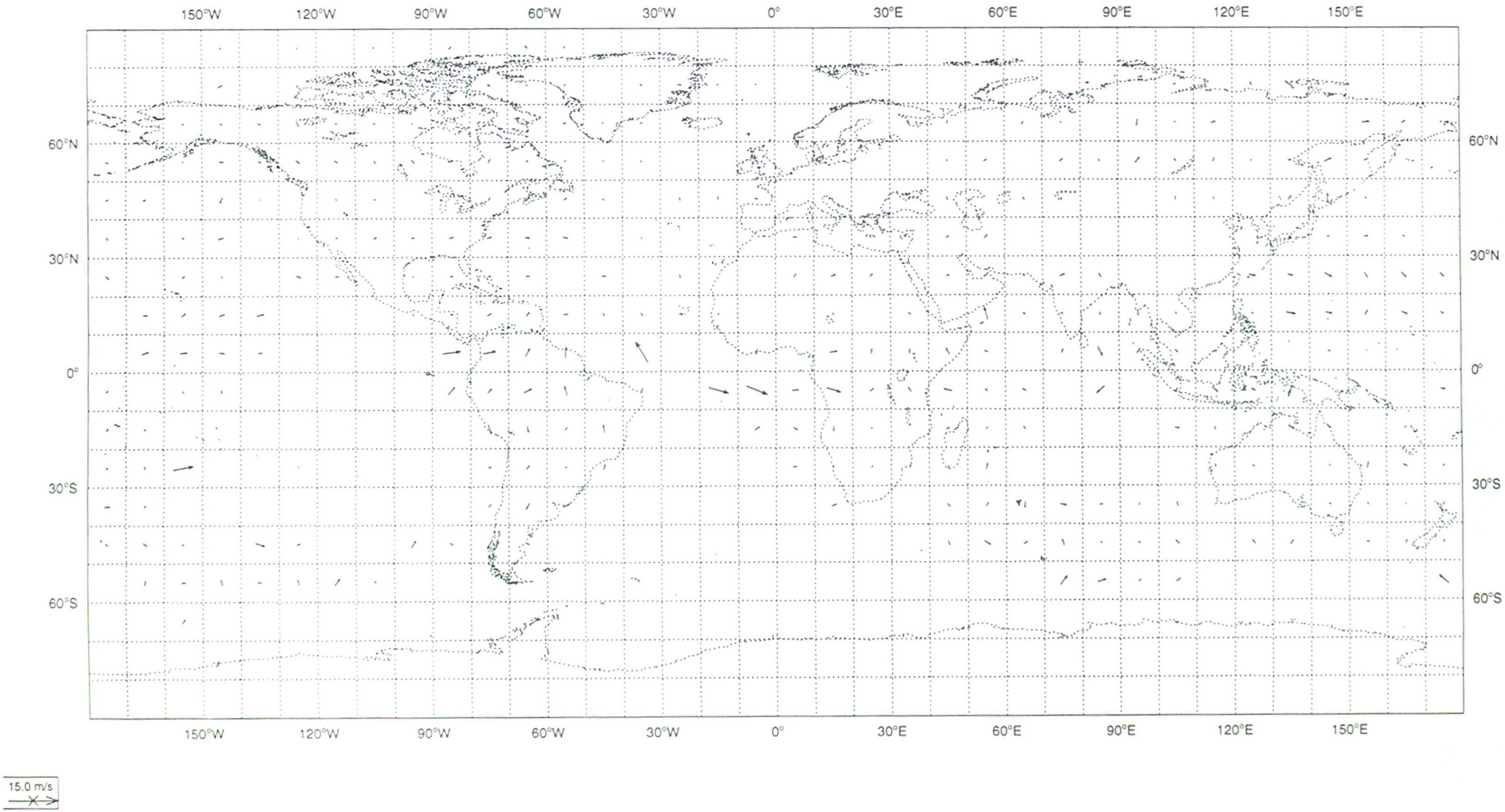

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

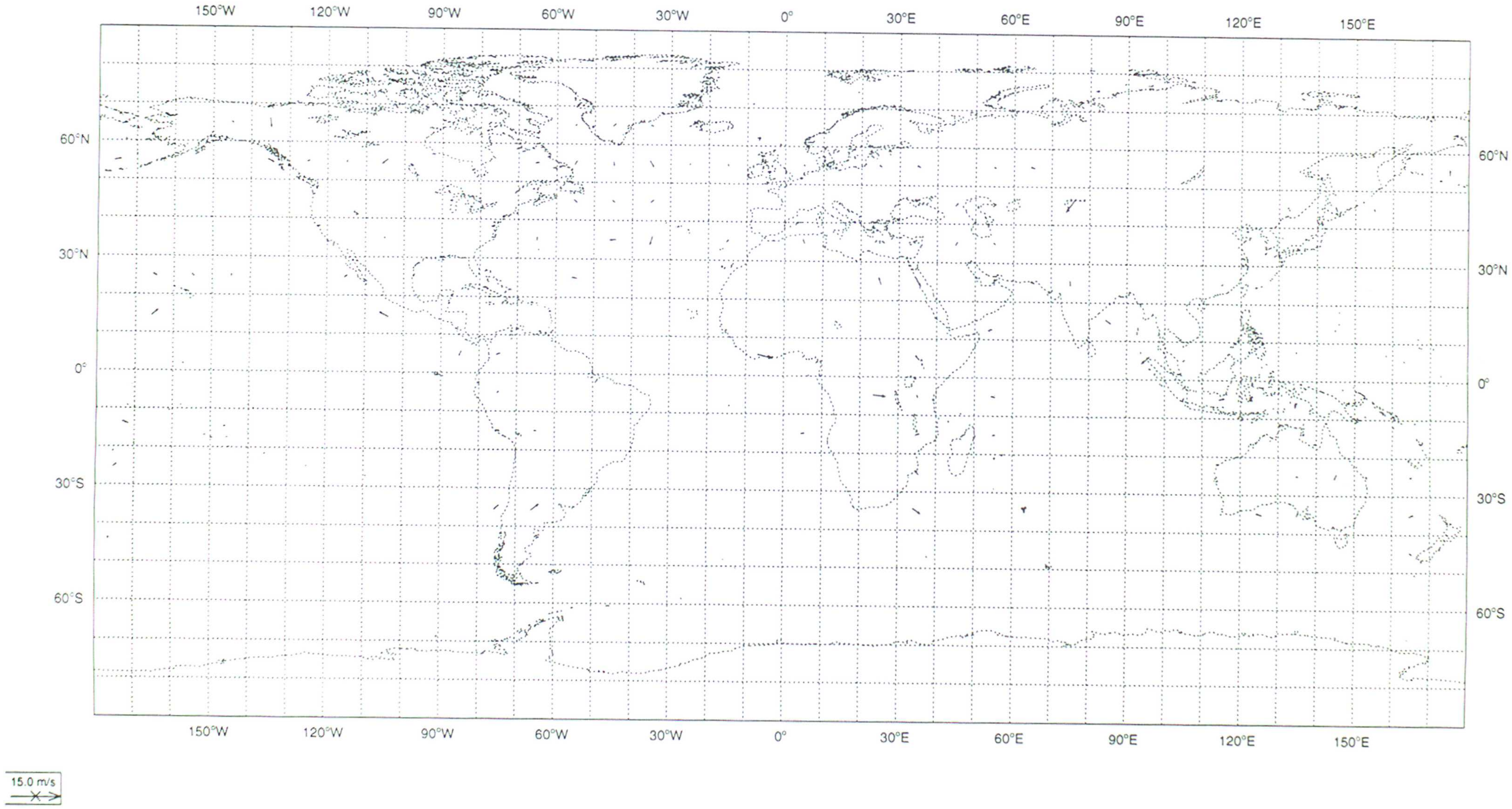

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

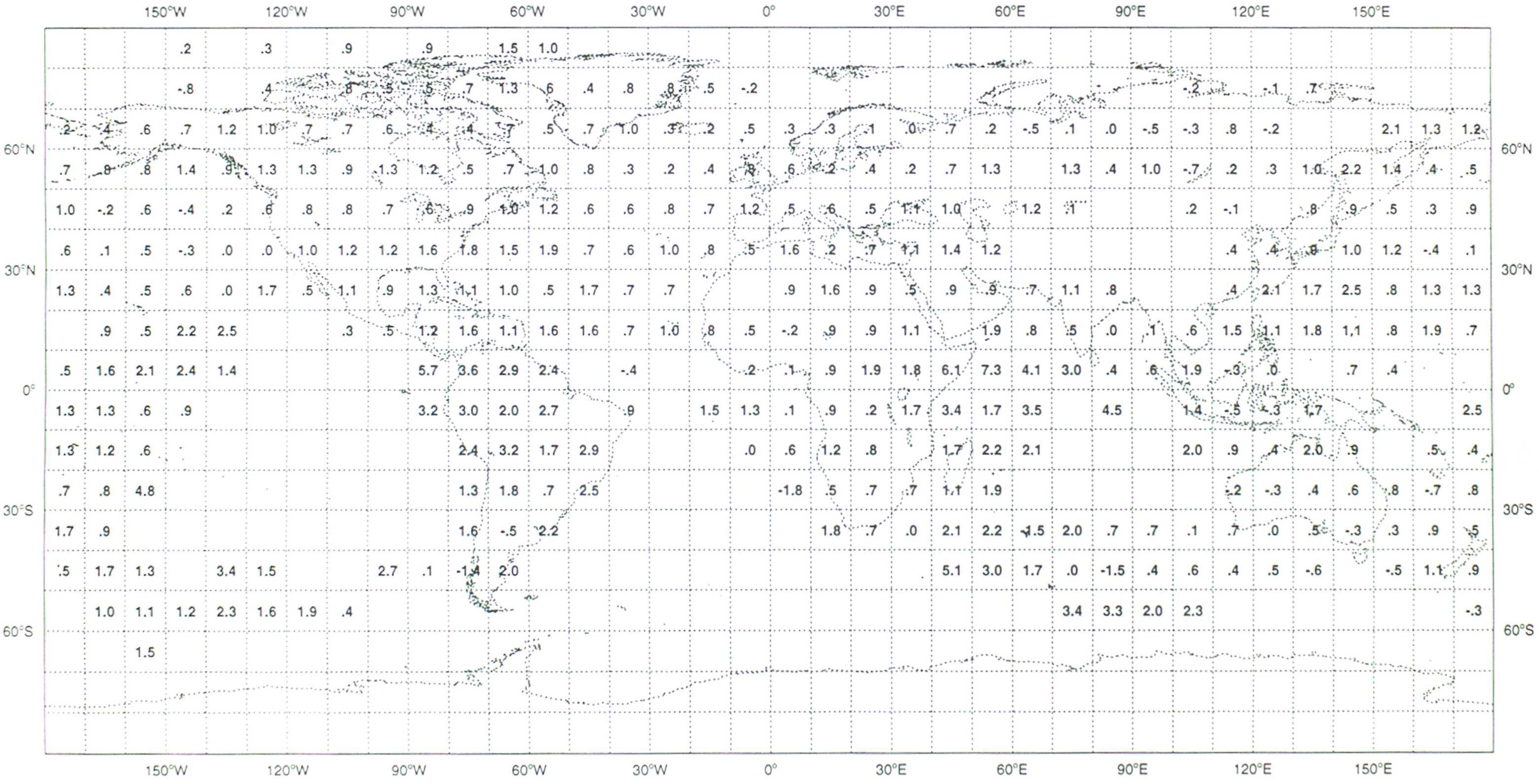

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
.2 .3 .9 .9 1.5 1.0
-.8 .4 .8 .5 .7 1.3 .6 .4 .8 .8 .5 -.2 -.2 -.1 .7
.2 .4 .6 .7 1.2 1.0 .7 .7 .6 .4 .4 .7 .5 .7 1.0 .3 .2 .5 .3 .3 .1 .0 .7 .2 -.5 .1 .0 -.5 -.3 .8 -.2 2.1 1.3 1.2
.7 .8 .8 1.4 .9 1.3 1.3 .9 1.3 1.2 .5 .7 1.0 .8 .3 .2 .4 .8 .6 .2 .4 .2 .7 1.3 1.3 .4 1.0 -.7 .2 .3 1.0 2.2 1.4 .4 .5
1.0 -.2 .6 -.4 .2 .6 .8 .8 .7 .6 .9 1.0 1.2 .6 .6 .8 .7 1.2 .5 .6 .5 1.1 1.0 1.2 .1 .2 -.1 .8 .9 .5 .3 .9
.6 .1 .5 -.3 .0 .0 1.0 1.2 1.2 1.6 1.8 1.5 1.9 .7 .6 1.0 .8 .5 1.6 .2 .7 1.1 1.4 1.2 .4 .4 .8 1.0 1.2 -.4 .1
1.3 .4 .5 .6 .0 1.7 .5 1.1 .9 1.3 1.1 1.0 .5 1.7 .7 .7 .9 1.6 .9 .5 .9 .9 .7 1.1 .8 .4 2.1 1.7 2.5 .8 1.3 1.3
.9 .5 2.2 2.5 .3 .5 1.2 1.6 1.1 1.6 1.6 .7 1.0 .8 .5 -.2 .9 .9 1.1 1.9 .8 .5 .0 .1 .6 1.5 1.1 1.8 1.1 .8 1.9 .7
.5 1.6 2.1 2.4 1.4 5.7 3.6 2.9 2.4 -.4 .2 .1 .9 1.9 1.8 6.1 7.3 4.1 3.0 .4 .6 1.9 -.3 .0 .7 .4
1.3 1.3 .6 .9 3.2 3.0 2.0 2.7 .9 1.5 1.3 .1 .9 .2 1.7 3.4 1.7 3.5 4.5 1.4 -.5 -.3 1.7 2.5
1.3 1.2 .6 2.4 3.2 1.7 2.9 .0 .6 1.2 .8 1.7 2.2 2.1 2.0 .9 .4 2.0 .9 .5 .4
.7 .8 4.8 1.3 1.8 .7 2.5 -1.8 .5 .7 .7 1.1 1.9 -.2 -.3 .4 .6 .8 -.7 .8
1.7 .9 1.6 -.5 2.2 1.8 .7 .0 2.1 2.2 1.5 2.0 .7 .7 .1 .7 .0 .5 -.3 .3 .9 .5
.5 1.7 1.3 3.4 1.5 2.7 .1 -1.4 2.0 5.1 3.0 1.7 .0 -1.5 .4 .6 .4 .5 -.6 -.5 1.1 .9
1.0 1.1 1.2 2.3 1.6 1.9 .4 3.4 3.3 2.0 2.3 -.3
1.5

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

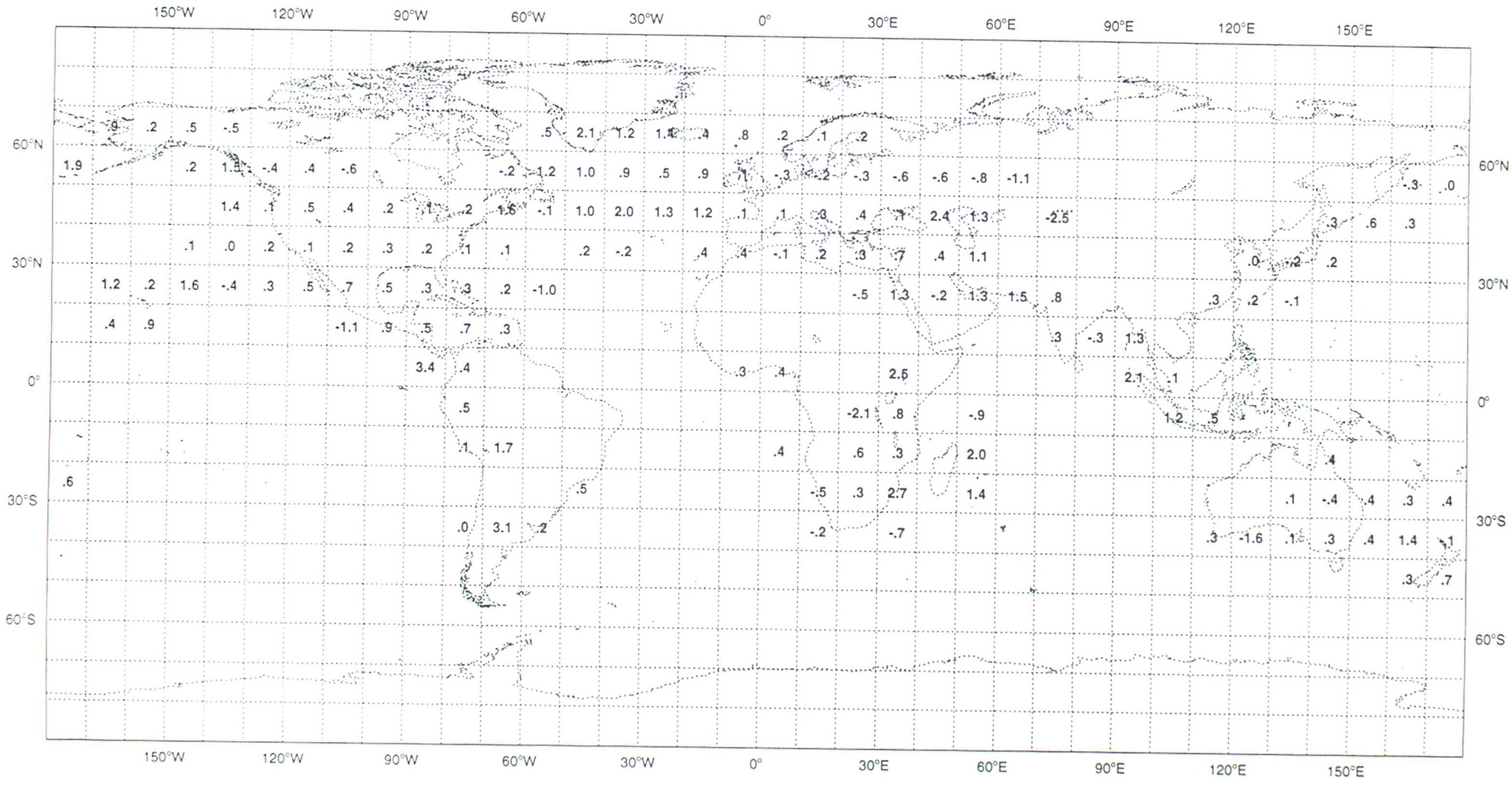

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.9 .2 .5 -.5 .5 2.1 1.2 1.4 .4 .8 .2 .1 .2
1.9 .2 1.3 -.4 .4 -.6 -.2 1.2 1.0 .9 .5 .9 .1 -.3 .2 -.3 -.6 -.6 -.8 -1.1 -.3 .0
1.4 .1 .5 .4 .2 .1 .2 1.6 -.1 1.0 2.0 1.3 1.2 .1 .1 .3 .4 .1 2.4 1.3 -2.5 .3 .6 .3
.1 .0 .2 .1 .2 .3 .2 .1 .1 .2 -.2 .4 .4 -.1 .2 .3 .7 .4 1.1 .0 .2 .2
1.2 .2 1.6 -.4 .3 .5 .7 .5 .3 .3 .2 -1.0 -.5 1.3 -.2 1.3 1.5 .8 .3 .2 -.1
.4 .9 -1.1 .9 .5 .7 .3 .3 -.3 1.3
3.4 .4 .3 .4 2.6 2.1 .1
.5 -2.1 .8 -.9 1.2 .5
.1 1.7 .4 .6 .3 2.0 .4
.6 .5 -.5 .3 2.7 1.4 .1 -.4 .4 .3 .4
.0 3.1 .2 -.2 -.7 .3 -1.6 .1 .3 .4 1.4 .1
.3 .7

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

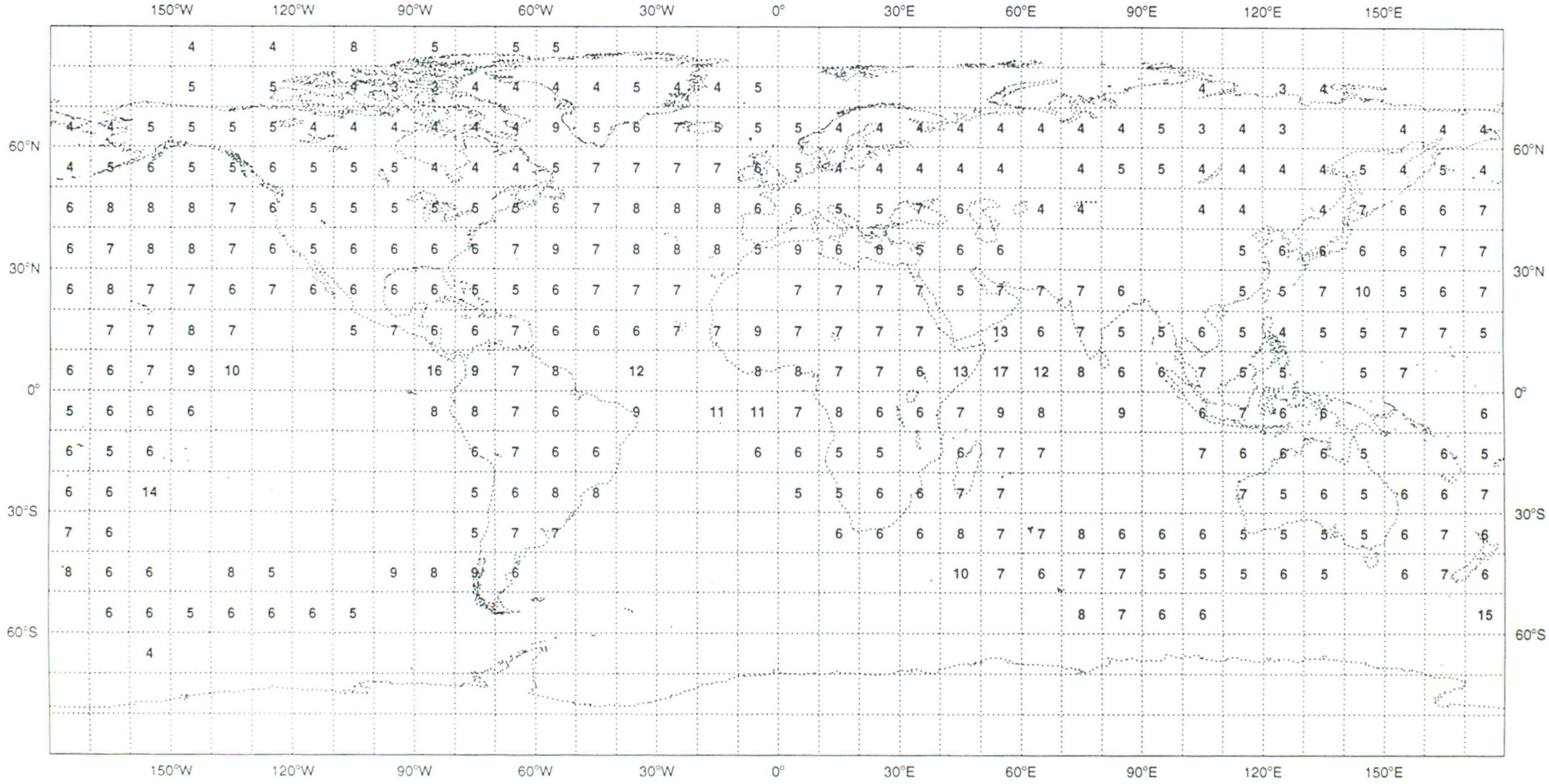

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4 4 8 5 5 5
5 5 4 3 3 4 4 4 4 5 4 4 5 4 3 4
4 4 5 5 5 5 4 4 4 4 4 4 9 5 6 7 5 5 5 4 4 4 4 4 4 4 4 5 3 4 3 4 4 4
4 5 6 5 5 6 5 5 5 4 4 4 5 7 7 7 7 6 5 4 4 4 4 4 4 5 5 4 4 4 4 5 4 5 4
6 8 8 8 7 6 5 5 5 5 5 5 6 7 8 8 8 6 6 5 5 7 6 4 4 4 4 4 7 6 6 7
6 7 8 8 7 6 5 6 6 6 6 7 9 7 8 8 8 5 9 6 6 5 6 6 5 6 6 6 6 7 7
6 8 7 7 6 7 6 6 6 6 5 5 6 7 7 7 7 7 7 7 5 7 7 7 6 5 5 7 10 5 6 7
7 7 8 7 5 7 6 6 7 6 6 6 7 7 9 7 7 7 7 13 6 7 5 5 6 5 4 5 5 7 7 5
6 6 7 9 10 16 9 7 8 12 8 8 7 7 6 13 17 12 8 6 6 7 5 5 5 7
5 6 6 6 8 8 7 6 9 11 11 7 8 6 6 7 9 8 9 6 7 6 6 6
6 5 6 6 7 6 6 6 6 5 5 6 7 7 7 6 6 6 5 6 5
6 6 14 5 6 8 8 5 5 6 6 7 7 7 5 6 5 6 6 7
7 6 5 7 7 6 6 6 8 7 7 8 6 6 6 5 5 5 5 6 7 6
8 6 6 8 5 9 8 9 6 10 7 6 7 7 5 5 5 6 5 6 7 6
6 6 5 6 6 6 5 8 7 6 6 15
4

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). FEBRUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

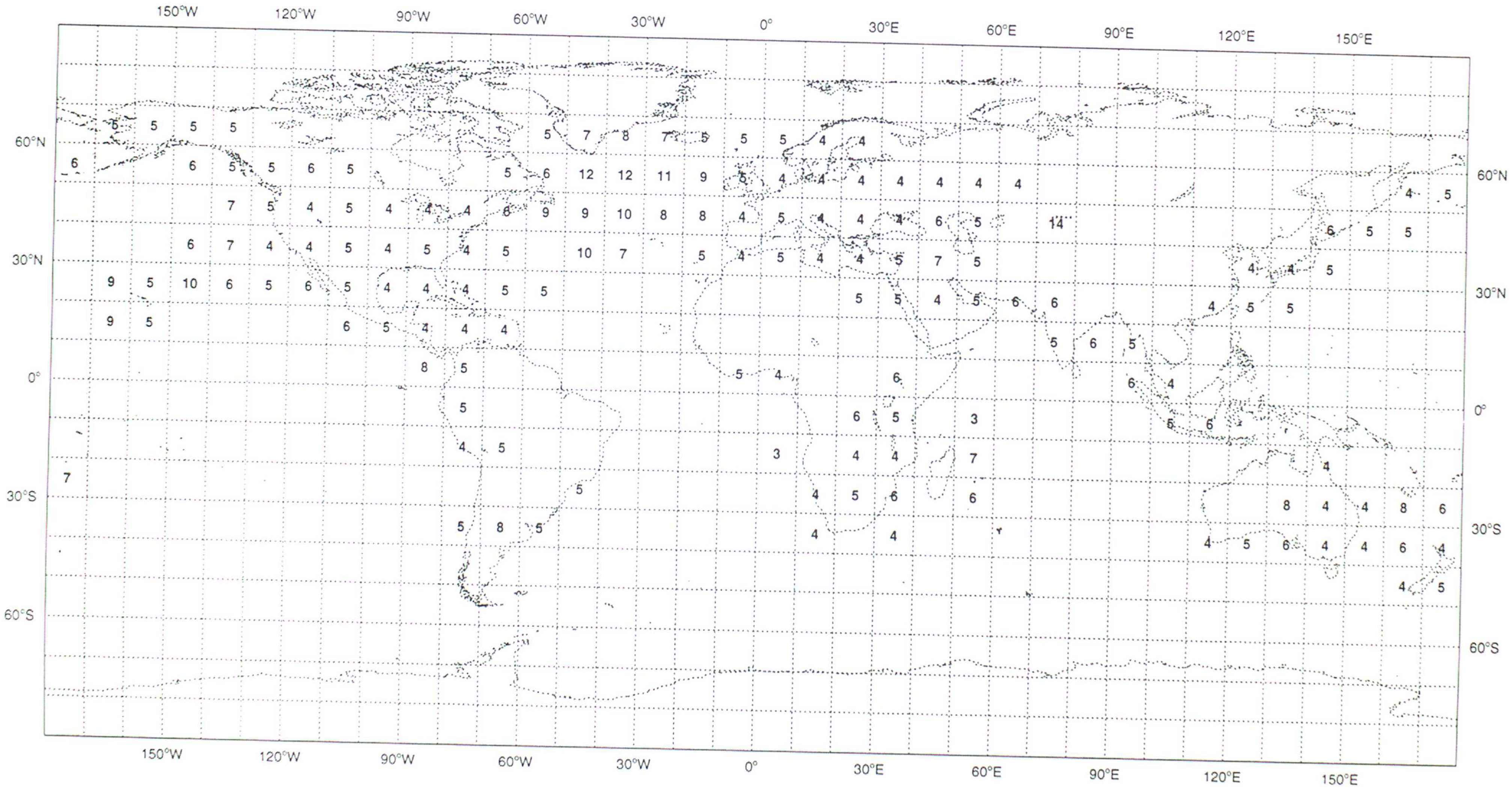

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	12	Z	30	73/ 80	11	1	92.8	245.0	262.0	5
23418	00	Z	50	65/ 57	20	2	115.1	175.9	210.2	6
24125	00	Z	850	68/ 112	28	0	13.6	-36.8	39.2	4
26477	12	Z	70	56/ 31	10	0	49.8	152.3	160.2	4
32098	00	Z	200	49/ 143	28	0	39.6	111.4	118.2	5
33837	00	Z	50	46/ 31	14	1	138.2	205.9	248.0	7
34247	12	Z	30	50/ 41	24	3	68.3	285.7	293.7	8
41112	12	Z	1000	18/ 43	25	0	15.1	-47.9	50.2	4
42027	00	Z	1000	34/ 75	16	0	35.1	39.3	52.7	5
42027	12	Z	1000	34/ 75	16	0	31.0	-15.1	34.4	4
42101	00	Z	150	30/ 76	24	0	45.2	-83.2	94.7	4
42314	12	Z	150	27/ 95	16	0	64.7	-146.6	160.2	4
42369	00	Z	150	27/ 81	16	0	73.6	-76.9	106.4	5
42369	12	Z	100	27/ 81	14	0	91.6	-65.2	112.5	4
42379	00	Z	30	27/ 83	17	1	106.2	212.0	237.1	4
42379	12	Z	30	27/ 83	11	1	111.5	205.5	233.8	7
42397	00	Z	150	27/ 88	14	1	56.7	-165.9	175.4	6
42397	12	Z	150	27/ 88	18	0	82.3	-69.2	107.5	6
42647	12	Z	150	23/ 73	10	0	32.3	134.1	137.9	6
42724	00	Z	150	24/ 91	20	0	89.9	-71.1	114.7	5
42724	12	Z	150	24/ 91	17	2	65.0	-135.1	150.0	6
42809	00	Z	200	23/ 88	26	0	56.4	-69.1	89.2	5
42867	00	Z	150	21/ 79	22	1	67.5	-70.0	97.2	6
42867	12	Z	50	21/ 79	12	0	85.2	132.2	157.3	4
42971	00	Z	50	20/ 86	17	1	115.6	157.6	195.5	4
42971	12	Z	70	20/ 86	13	1	121.0	103.7	159.3	8
43003	12	Z	50	19/ 73	9	3	80.2	229.2	242.9	5
43014	12	Z	150	20/ 75	12	0	80.5	106.8	133.8	6
43128	00	Z	150	17/ 78	24	0	79.2	-115.9	140.4	6
43185	00	Z	150	16/ 81	21	0	87.2	-73.6	114.1	6
43185	12	Z	50	16/ 81	13	1	92.3	183.2	205.1	7
43192	00	Z	150	15/ 74	18	1	56.8	-159.7	169.5	7
43279	00	Z	200	13/ 80	24	0	69.8	-99.1	121.2	6
43279	12	Z	200	13/ 80	22	0	76.1	-51.2	91.7	5
43295	12	Z	50	13/ 78	15	1	102.3	210.3	233.9	5
43333	00	Z	150	12/ 93	22	0	73.2	-99.5	123.6	5
43346	00	Z	100	11/ 80	27	0	61.4	-121.9	136.5	4
43369	00	Z	30	8/ 73	6	4	130.7	236.3	270.0	6
43369	12	Z	50	8/ 73	13	4	45.2	321.5	324.6	7
43371	00	Z	150	8/ 77	25	0	55.3	-113.2	126.0	5
82193	12	Z	50	-1/ -48	1	0	0.0	194.0	194.0	4
82332	12	Z	50	-3/ -60	5	0	48.7	232.0	237.1	4
91366	00	Z	50	9/ 168	23	3	99.7	201.7	224.9	6

Figure 8. TEMP 500 hPa geopotential mean daily count. FEBRUARY 2002
All hours
Global average number of observations in 24 hours = 1179

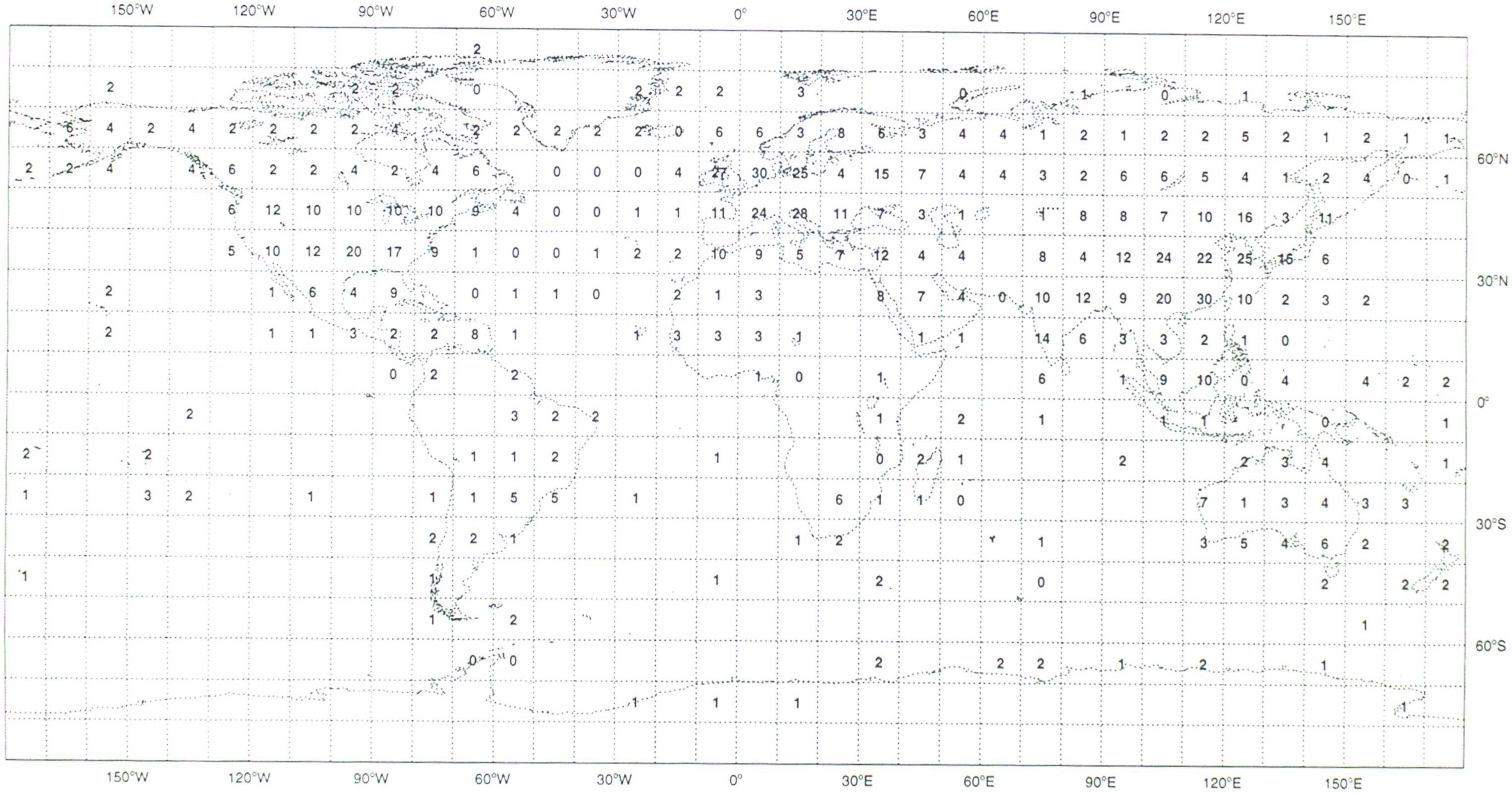

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 0 2 2 2 3 0 1 0 1
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 6 6 3 8 6 3 4 4 1 2 1 2 2 5 2 1 2 1 1
2 2 4 4 6 2 2 4 2 4 6 0 0 0 4 27 30 25 4 15 7 4 4 3 2 6 6 5 4 1 2 4 0 1
6 12 10 10 10 10 9 4 0 0 1 1 11 24 28 11 7 3 1 1 8 8 7 10 16 3 11
5 10 12 20 17 9 1 0 0 1 2 2 10 9 5 7 12 4 4 8 4 12 24 22 25 16 6
2 1 6 4 9 0 1 1 0 2 1 3 8 7 4 0 10 12 9 20 30 10 2 3 2
2 1 1 3 2 2 8 1 1 3 3 3 1 1 1 14 6 3 3 2 1 0
0 2 2 1 0 1 6 1 9 10 0 4 4 2 2
2 3 2 2 1 2 1 1 1 0 1
2 2 1 1 2 1 0 2 1 2 2 3 4 1
1 3 2 1 1 1 5 5 1 6 1 1 0 7 1 3 4 3 3
2 2 1 1 2 1 3 5 4 6 2 2
1 1 1 2 0 2 2 2
1 2 1
0 0 2 2 2 1 2 1
1 1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	100	-5/ -81	13	0	100	-3.6	4.7	24.2	3
PSPIU	12	V	100	-5/ -81	11	0	100	2.5	-9.6	27.3	3
38341	00	V	250	43/ 71	11	0	27	-3.5	-6.1	16.2	1
40265	00	V	200	32/ 36	23	1	8	-2.0	1.7	15.3	1
40394	00	V	150	27/ 42	24	0	100	-16.8	-13.1	29.7	3
40394	12	V	100	27/ 42	24	0	100	-12.7	-14.0	30.5	3
40754	12	V	250	36/ 51	17	0	11	6.3	-1.7	17.7	2
41594	12	V	250	32/ 73	17	0	58	-8.4	1.3	18.5	3
42182	00	V	250	29/ 77	21	0	100	-13.0	-2.0	18.9	4
42182	12	V	250	29/ 77	26	0	100	-11.9	-3.0	16.4	3
42361	12	V	300	26/ 78	10	0	100	-2.1	-4.5	26.2	1
42369	00	V	250	27/ 81	19	0	100	-9.8	-3.2	17.5	3
42369	12	V	300	27/ 81	10	1	100	-5.8	2.1	15.6	1
42379	00	V	300	27/ 83	17	0	100	-0.2	3.9	18.7	1
42379	12	V	300	27/ 83	19	0	100	-5.0	1.2	19.9	2
42397	00	V	300	27/ 88	16	0	100	-8.2	-6.0	15.5	1
42410	00	V	300	26/ 92	14	0	100	-2.4	5.7	19.2	2
42410	12	V	500	26/ 92	18	0	100	7.8	4.4	18.8	1
42667	00	V	300	23/ 77	14	0	100	-3.2	13.3	17.1	2
42667	12	V	300	23/ 77	11	0	100	-4.7	12.6	16.6	2
42724	12	V	300	24/ 91	10	0	100	7.2	-8.4	22.5	1
43003	00	V	200	19/ 73	25	0	8	5.4	4.6	15.4	1
43003	12	V	150	19/ 73	20	0	15	6.8	4.1	15.4	1
48407	12	V	150	15/ 105	23	0	100	-6.8	-8.9	15.4	1
48650	00	V	100	3/ 102	28	0	10	10.4	-1.2	16.4	1
48698	12	V	100	1/ 104	26	0	7	7.6	2.0	15.6	1
56691	00	V	100	27/ 104	25	0	100	10.8	0.3	19.2	2
56691	12	V	100	27/ 104	25	2	100	8.3	5.6	17.5	4
57067	12	V	100	34/ 111	23	0	100	13.5	2.7	16.3	1
58203	00	V	150	33/ 116	27	0	11	-3.3	3.0	15.4	1
60571	12	V	250	32/ -2	22	0	4	0.7	1.4	18.1	1
60620	12	V	250	28/ 0	11	0	100	-15.8	2.9	23.5	2
60656	12	V	250	28/ -8	18	0	100	-11.2	-1.7	15.8	1
61024	12	V	150	17/ 8	16	0	18	-15.5	1.1	40.6	1
61223	12	V	300	17/ -3	13	0	7	-4.3	1.9	17.3	1
62010	12	V	300	33/ 13	10	0	10	7.0	0.7	18.1	1
62337	00	V	200	31/ 34	26	0	100	-9.0	12.5	19.0	4
62337	12	V	150	31/ 34	21	0	100	-9.2	12.0	21.3	4
62378	00	V	200	30/ 31	24	0	100	-13.6	-4.5	19.6	3
62378	12	V	200	30/ 31	20	0	100	-13.6	-6.4	19.7	4
65548	12	V	150	7/ -8	10	0	20	3.0	0.3	16.0	1
68442	12	V	250	-29/ 26	11	0	100	-18.8	-2.7	25.9	2
68512	12	V	200	-30/ 18	18	0	100	-15.1	4.0	20.5	4
72214	00	V	200	30/ -84	19	0	42	1.4	-1.9	15.5	1
72214	12	V	150	30/ -84	15	0	40	6.6	2.7	16.9	1
83612	12	V	100	-20/ -55	22	0	100	12.9	-1.4	17.0	1
92044	00	V	100	-2/ 147	11	0	9	2.8	0.0	17.0	1
96413	00	V	100	1/ 110	27	0	11	6.4	-2.3	15.1	1
96749	00	V	100	-6/ 107	12	0	16	8.1	1.3	16.6	1
98223	00	V	150	18/ 121	20	0	100	13.0	11.1	22.8	3

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. FEBRUARY 2002
All hours
Global average number of observations in 24 hours = 1371

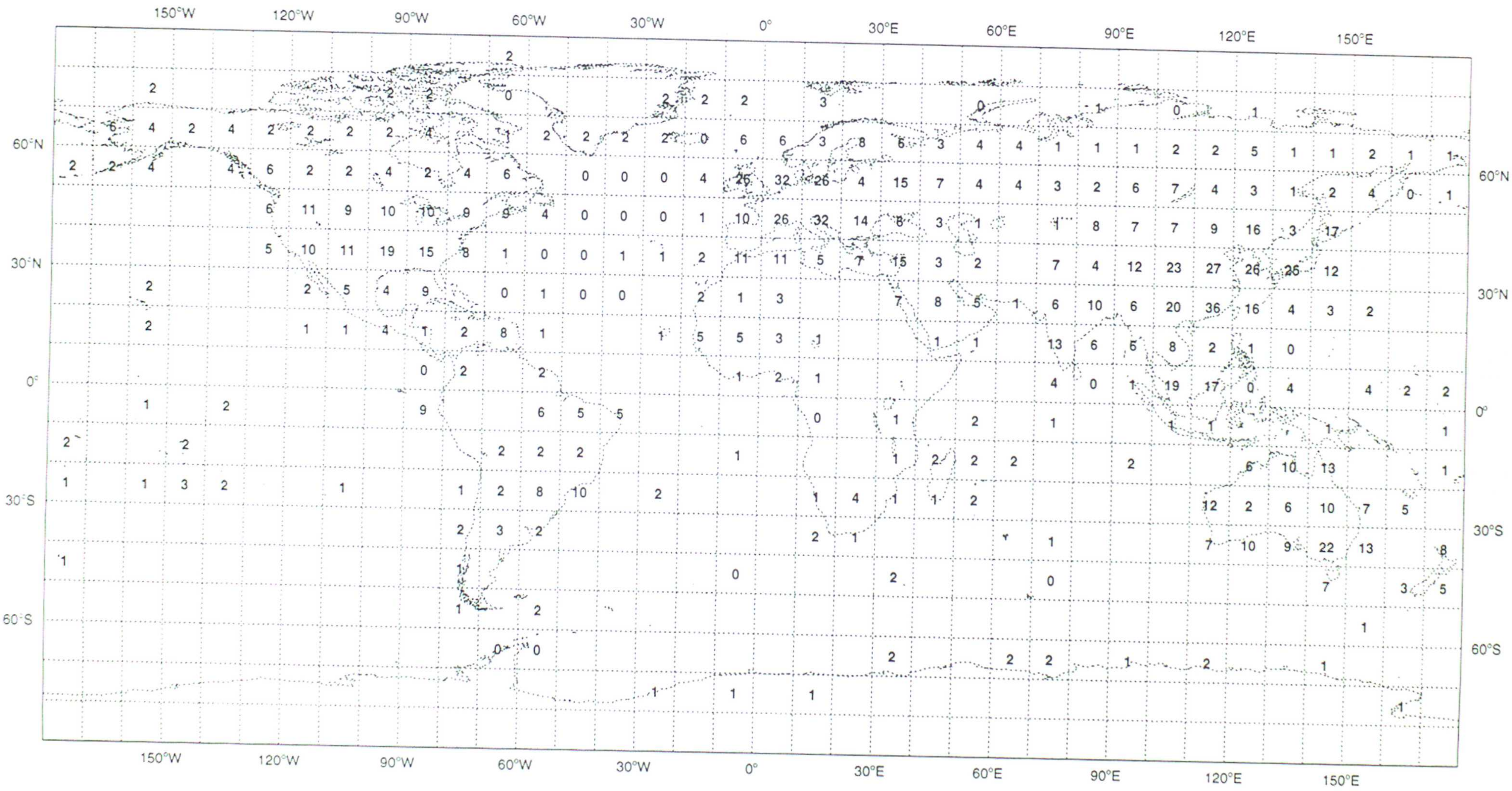

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17030	12	DD	41/ 36	25	10.9	9.3	17.0
29612	12	DD	55/ 78	24	23.1	3.1	7.5
42667	00	DD	23/ 77	11	-25.8	8.6	8.6
42667	12	DD	23/ 77	10	-24.2	8.5	8.5
57816	00	DD	26/ 107	27	-10.1	3.4	7.3
59981	00	DD	17/ 112	20	18.6	3.4	26.6
59981	12	DD	17/ 112	20	20.3	5.7	20.1
60490	12	DD	36/ -1	22	-10.0	4.0	11.6
62337	00	DD	31/ 34	25	-19.7	8.5	11.6
89009	12	DD	-90/ 0	9	-10.9	6.6	15.7

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: February 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. FEBRUARY 2002
Global average number of observations in 24 hours = 51914

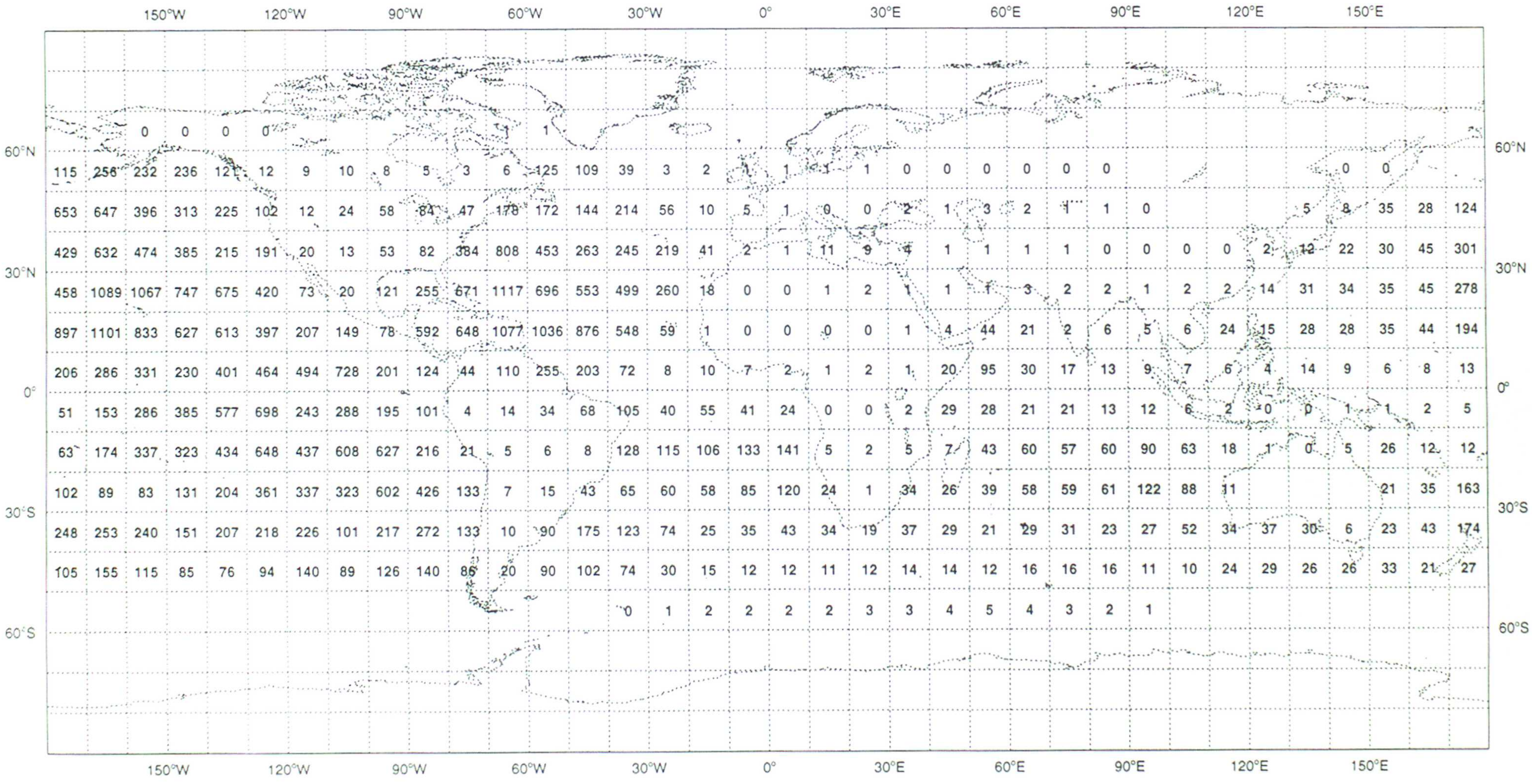

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 0 0 0 1 1
115 256 232 236 12 12 9 10 8 5 3 6 125 109 39 3 2 1 1 1 0 0 0 0 0 0 0 0 0
653 647 396 313 225 102 12 24 58 84 47 178 172 144 214 56 10 5 1 0 0 2 1 3 2 1 1 0 5 8 35 28 124
429 632 474 385 215 191 20 13 53 82 384 808 453 263 245 219 41 2 1 11 9 4 1 1 1 1 0 0 0 0 2 12 22 30 45 301
458 1089 1067 747 675 420 73 20 121 255 671 1117 696 553 499 260 18 0 0 1 2 1 1 1 3 2 2 1 2 2 14 31 34 35 45 278
897 1101 833 627 613 397 207 149 78 592 648 1077 1036 876 548 59 1 0 0 0 0 1 4 44 21 2 6 5 6 24 15 28 28 35 44 194
206 286 331 230 401 464 494 728 201 124 44 110 255 203 72 8 10 7 2 1 2 1 20 95 30 17 13 9 7 6 4 14 9 6 8 13
51 153 286 385 577 698 243 288 195 101 4 14 34 68 105 40 55 41 24 0 0 2 29 28 21 21 13 12 6 2 0 0 1 1 2 5
63 174 337 323 434 648 437 608 627 216 21 5 6 8 128 115 106 133 141 5 2 5 7 43 60 57 60 90 63 18 1 0 5 26 12 12
102 89 83 131 204 361 337 323 602 426 133 7 15 43 65 60 58 85 120 24 1 34 26 39 58 59 61 122 88 11 21 35 163
248 253 240 151 207 218 226 101 217 272 133 10 90 175 123 74 25 35 43 34 19 37 29 21 29 31 23 27 52 34 37 30 6 23 43 174
105 155 115 85 76 94 140 89 126 140 86 20 90 102 74 30 15 12 12 11 12 14 14 12 16 16 16 11 10 24 29 26 26 33 21 27
0 1 2 2 2 2 3 3 4 5 4 3 2 1

Figure 11. SATOB 701 - 1000 hPa vector mean wind. FEBRUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

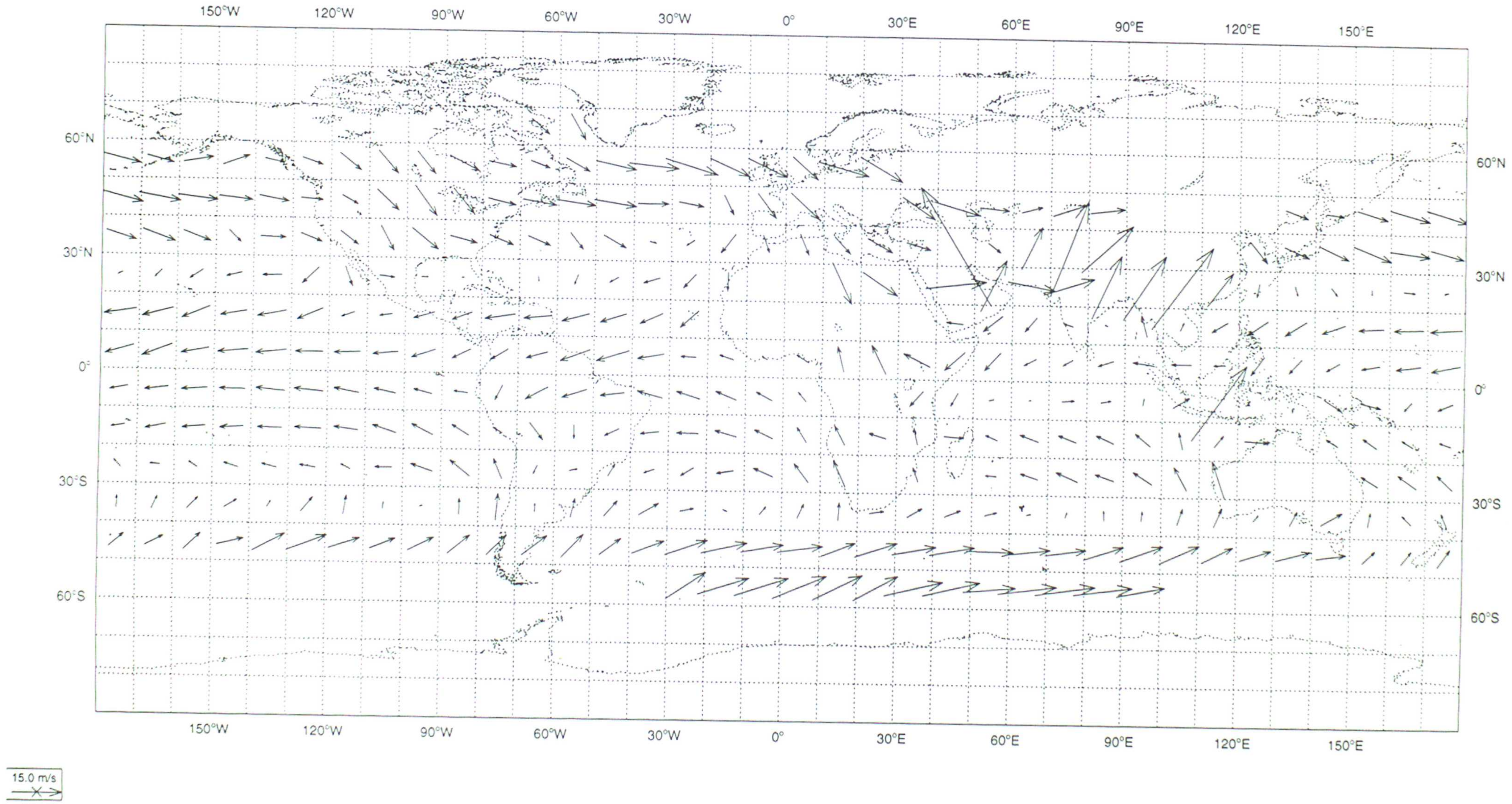

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. FEBRUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

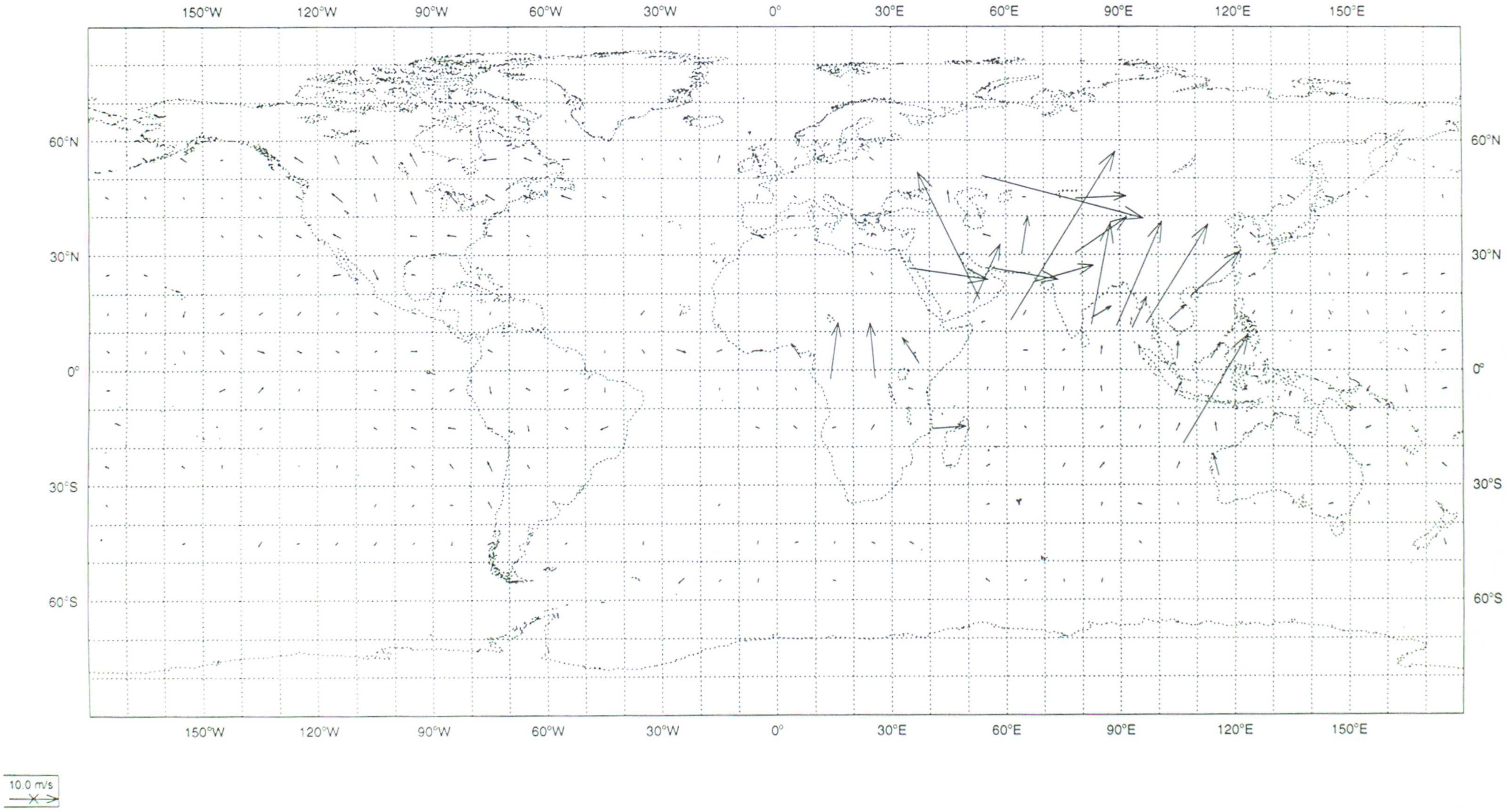

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). FEBRUARY 2002

All observations

Values are plotted where greater than 10 obs are present

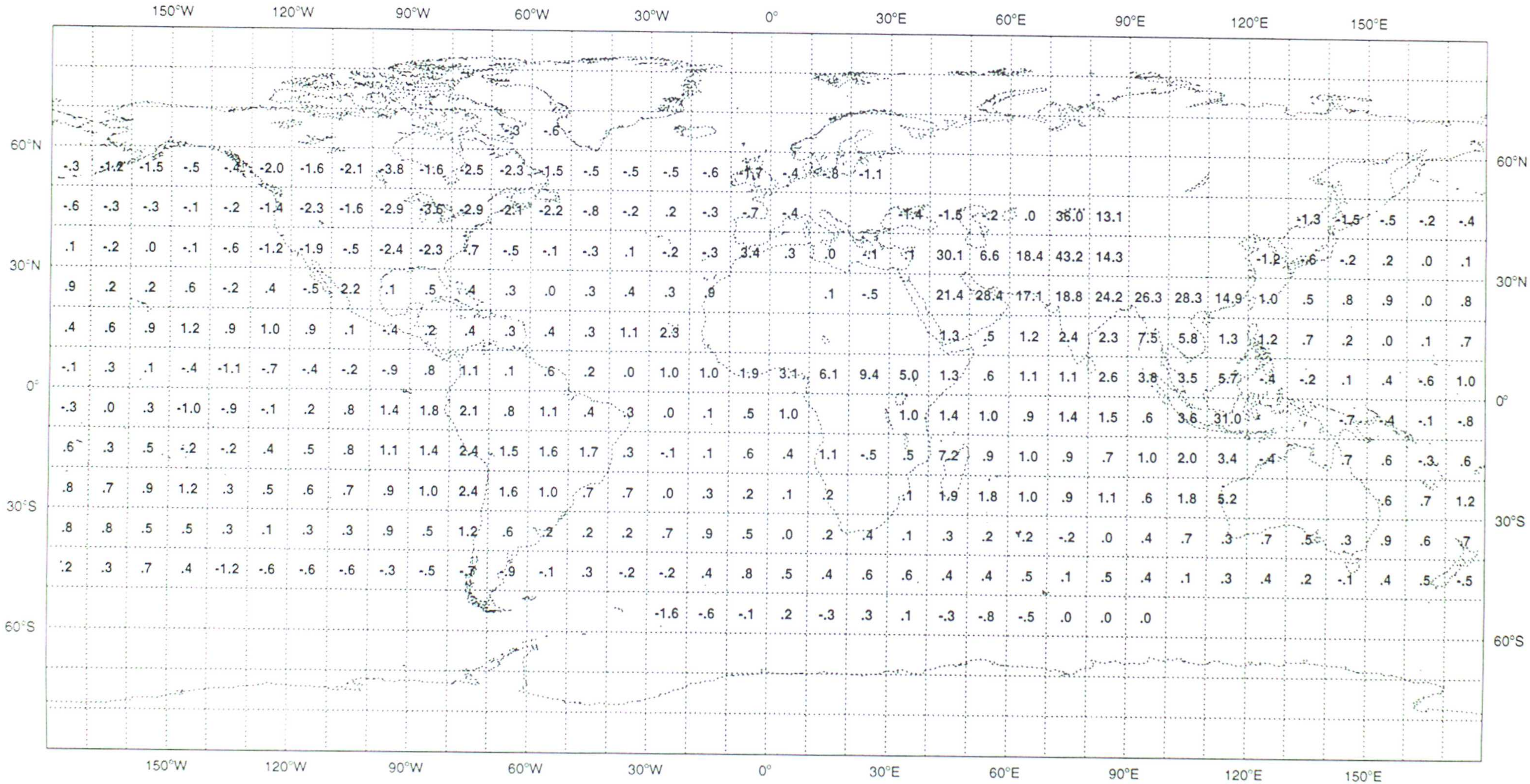

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.3 -.6
-.3 -1.2 -1.5 -.5 -.4 -2.0 -1.6 -2.1 -3.8 -1.6 -2.5 -2.3 -1.5 -.5 -.5 -.5 -.6 -1.7 -.4 -.8 -1.1
-.6 -.3 -.3 -.1 -.2 -1.4 -2.3 -1.6 -2.9 -3.5 -2.9 -2.1 -2.2 -.8 -.2 .2 -.3 -.7 -.4 -1.4 -1.5 -.2 .0 36.0 13.1 -1.3 -1.5 -.5 -.2 -.4
.1 -.2 .0 -.1 -.6 -1.2 -1.9 -.5 -2.4 -2.3 -.7 -.5 -.1 -.3 .1 -.2 -.3 3.4 .3 .0 -.1 .1 30.1 6.6 18.4 43.2 14.3 -1.2 -.6 -.2 .2 .0 .1
.9 .2 .2 .6 -.2 .4 -.5 2.2 .1 .5 .4 .3 .0 .3 .4 .3 .9 .1 -.5 21.4 28.4 17.1 18.8 24.2 26.3 28.3 14.9 1.0 .5 .8 .9 .0 .8
.4 .6 .9 1.2 .9 1.0 .9 .1 -.4 .2 .4 .3 .4 .3 1.1 2.3 1.3 .5 1.2 2.4 2.3 7.5 5.8 1.3 1.2 .7 .2 .0 .1 .7
-.1 .3 .1 -.4 -1.1 -.7 -.4 -.2 -.9 .8 1.1 .1 .6 .2 .0 1.0 1.0 -1.9 3.1 6.1 9.4 5.0 1.3 .6 1.1 1.1 2.6 3.8 3.5 5.7 -.4 -.2 .1 .4 -.6 1.0
-.3 .0 .3 -1.0 -.9 -.1 .2 .8 1.4 1.8 2.1 .8 1.1 .4 .3 .0 .1 .5 1.0 1.0 1.4 1.0 .9 1.4 1.5 .6 3.6 31.0 -.7 -.4 -.1 -.8
.6 .3 .5 -.2 -.2 .4 .5 .8 1.1 1.4 2.4 1.5 1.6 1.7 .3 -.1 .1 .6 .4 1.1 -.5 .5 7.2 .9 1.0 .9 .7 1.0 2.0 3.4 -.4 .7 .6 -.3 .6
.8 .7 .9 1.2 .3 .5 .6 .7 .9 1.0 2.4 1.6 1.0 .7 .7 .0 .3 .2 .1 .2 .1 1.9 1.8 1.0 .9 1.1 .6 1.8 5.2 .6 .7 1.2
.8 .8 .5 .5 .3 .1 .3 .3 .9 .5 1.2 .6 .2 .2 .2 .7 .9 .5 .0 .2 .4 .1 .3 .2 .2 -.2 .0 .4 .7 .3 .7 .5 .3 .9 .6 .7
.2 .3 .7 .4 -1.2 -.6 -.6 -.6 -.3 -.5 -.7 -.9 -.1 .3 -.2 -.2 .4 .8 .5 .4 .6 .6 .4 .4 .5 .1 .5 .4 .1 .3 .4 .2 -.1 .4 .5 -.5
-1.6 -.6 -.1 .2 -.3 .3 .1 -.3 -.8 -.5 .0 .0 .0

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). FEBRUARY 2002

All observations

Values are plotted where greater than 10 obs are present

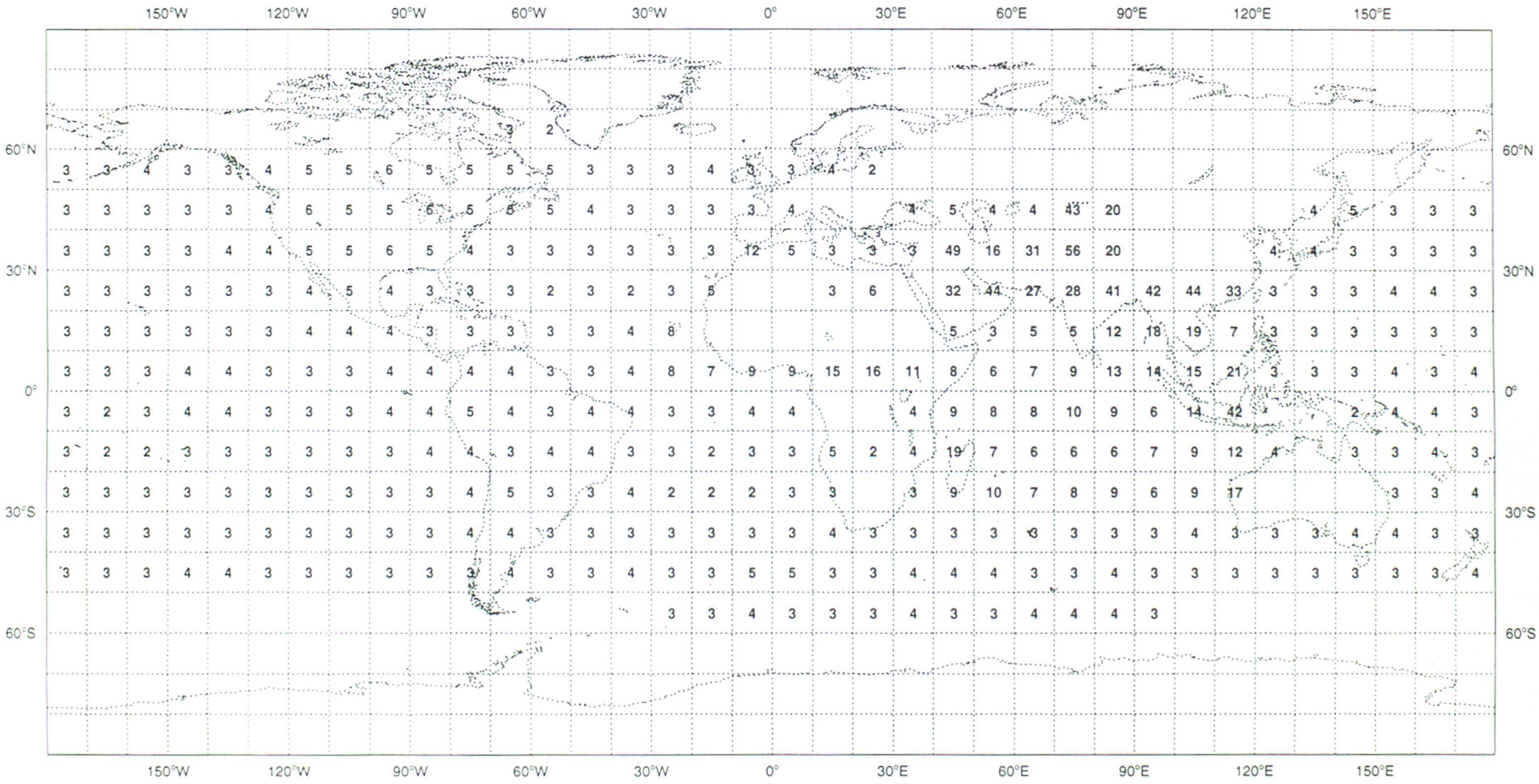

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3 2
3 3 4 3 3 4 5 5 6 5 5 5 5 3 3 3 4 3 3 4 2
3 3 3 3 3 4 6 5 5 6 5 5 5 4 3 3 3 3 4 4 5 4 4 43 20 4 5 3 3 3
3 3 3 3 4 4 5 5 6 5 4 3 3 3 3 3 3 12 5 3 3 3 49 16 31 56 20 4 4 3 3 3 3
3 3 3 3 3 3 4 5 4 3 3 3 2 3 2 3 5 3 6 32 44 27 28 41 42 44 33 3 3 3 4 4 3
3 3 3 3 3 3 4 4 4 3 3 3 3 3 4 8 5 3 5 5 12 18 19 7 3 3 3 3 3 3
3 3 3 4 4 3 3 3 4 4 4 4 3 3 4 8 7 9 9 15 16 11 8 6 7 9 13 14 15 21 3 3 3 4 3 4
3 2 3 4 4 3 3 3 4 4 5 4 3 4 4 3 3 4 4 4 9 8 8 10 9 6 14 42 2 4 4 3
3 2 2 3 3 3 3 3 3 4 4 3 4 4 3 3 2 3 3 5 2 4 19 7 6 6 6 7 9 12 4 3 3 4 3
3 3 3 3 3 3 3 3 3 3 4 5 3 3 4 2 2 2 3 3 3 9 10 7 8 9 6 9 17 3 3 4
3 3 3 3 3 3 3 3 3 3 4 4 3 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 4 3 3 3 4 4 3 3
3 3 3 4 4 3 3 3 3 3 3 4 3 3 4 3 3 5 5 3 3 4 4 4 3 3 4 3 3 3 3 3 3 3 3 4
3 3 4 3 3 3 4 3 3 4 4 4 3

Figure 15. SATOB 401 - 700 hPa mean daily count. FEBRUARY 2002
Global average number of observations in 24 hours = 16050

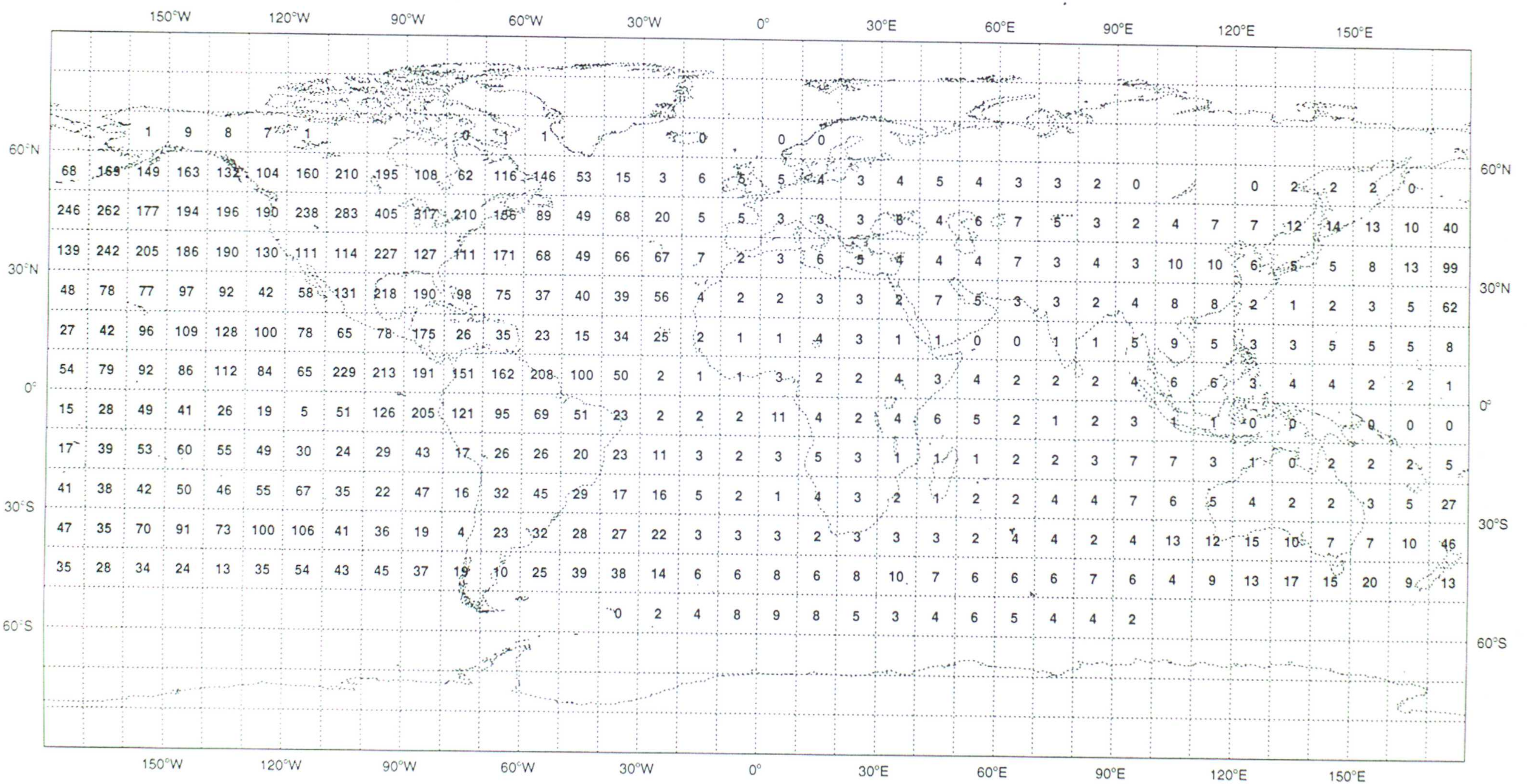

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
1 9 8 7 1 0 1 1 0 0 0
68 169 149 163 132 104 160 210 195 108 62 116 146 53 15 3 6 5 5 4 3 4 5 4 3 3 2 0 0 2 2 2 0
246 262 177 194 196 190 238 283 405 317 210 156 89 49 68 20 5 5 3 3 3 8 4 6 7 5 3 2 4 7 7 12 14 13 10 40
139 242 205 186 190 130 111 114 227 127 111 171 68 49 66 67 7 2 3 6 5 4 4 4 7 3 4 3 10 10 6 5 5 8 13 99
48 78 77 97 92 42 58 131 218 190 98 75 37 40 39 56 4 2 2 3 3 2 7 5 3 3 2 4 8 8 2 1 2 3 5 62
27 42 96 109 128 100 78 65 78 175 26 35 23 15 34 25 2 1 1 4 3 1 1 0 0 1 1 5 9 5 3 3 5 5 5 8
54 79 92 86 112 84 65 229 213 191 151 162 208 100 50 2 1 1 3 2 2 4 3 4 2 2 2 4 6 6 3 4 4 2 2 1
15 28 49 41 26 19 5 51 126 205 121 95 69 51 23 2 2 2 11 4 2 4 6 5 2 1 2 3 1 1 0 0 0 0 0
17 39 53 60 55 49 30 24 29 43 17 26 26 20 23 11 3 2 3 5 3 1 1 1 2 2 3 7 7 3 1 0 2 2 2 5
41 38 42 50 46 55 67 35 22 47 16 32 45 29 17 16 5 2 1 4 3 2 1 2 2 4 4 7 6 5 4 2 2 3 5 27
47 35 70 91 73 100 106 41 36 19 4 23 32 28 27 22 3 3 3 2 3 3 3 2 4 4 2 4 13 12 15 10 7 7 10 46
35 28 34 24 13 35 54 43 45 37 19 10 25 39 38 14 6 6 8 6 8 10 7 6 6 6 7 6 4 9 13 17 15 20 9 13
0 2 4 8 9 8 5 3 4 6 5 4 4 2
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S

Figure 16. SATOB 401 - 700 hPa vector mean wind. FEBRUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

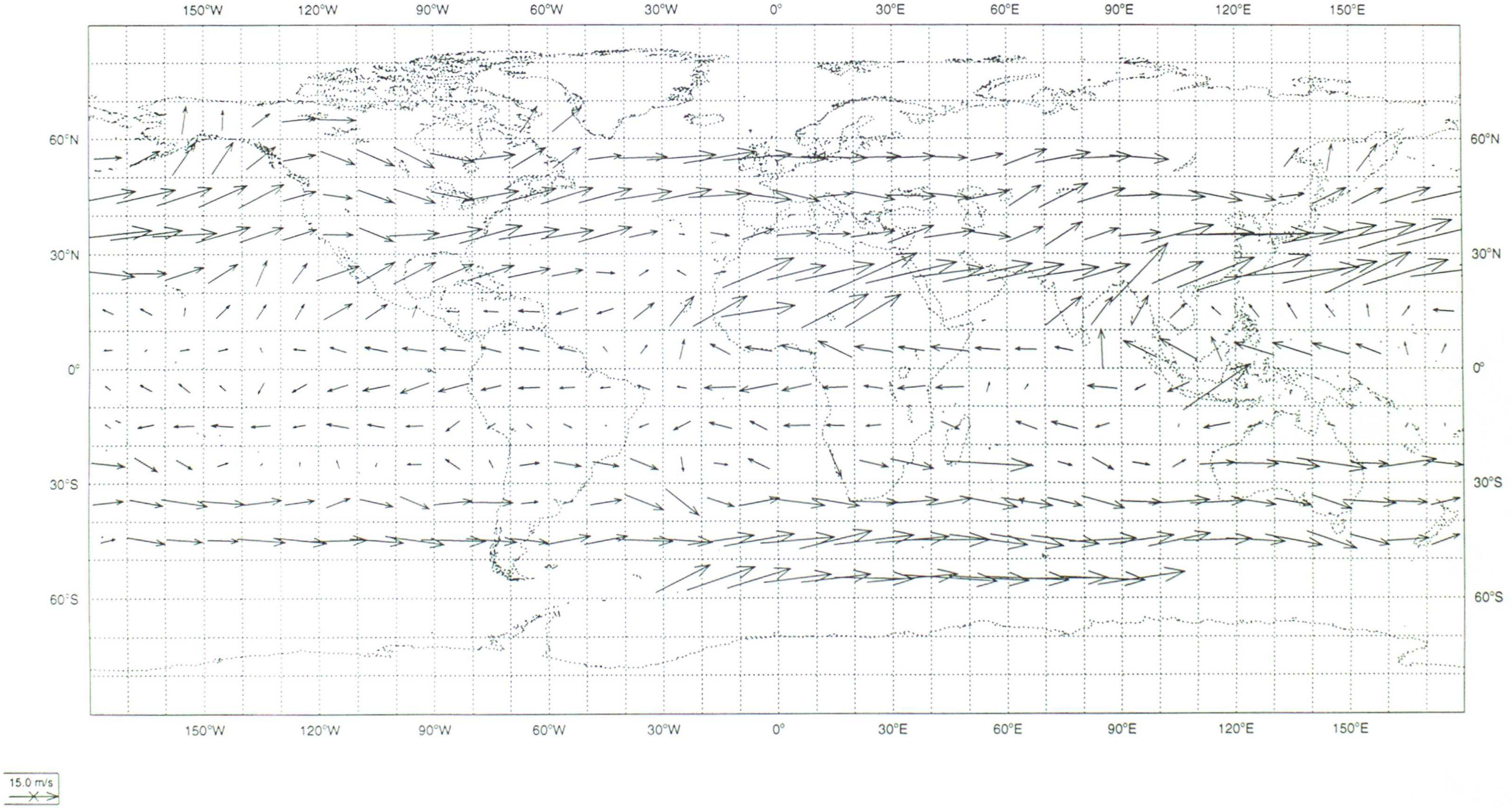

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. FEBRUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

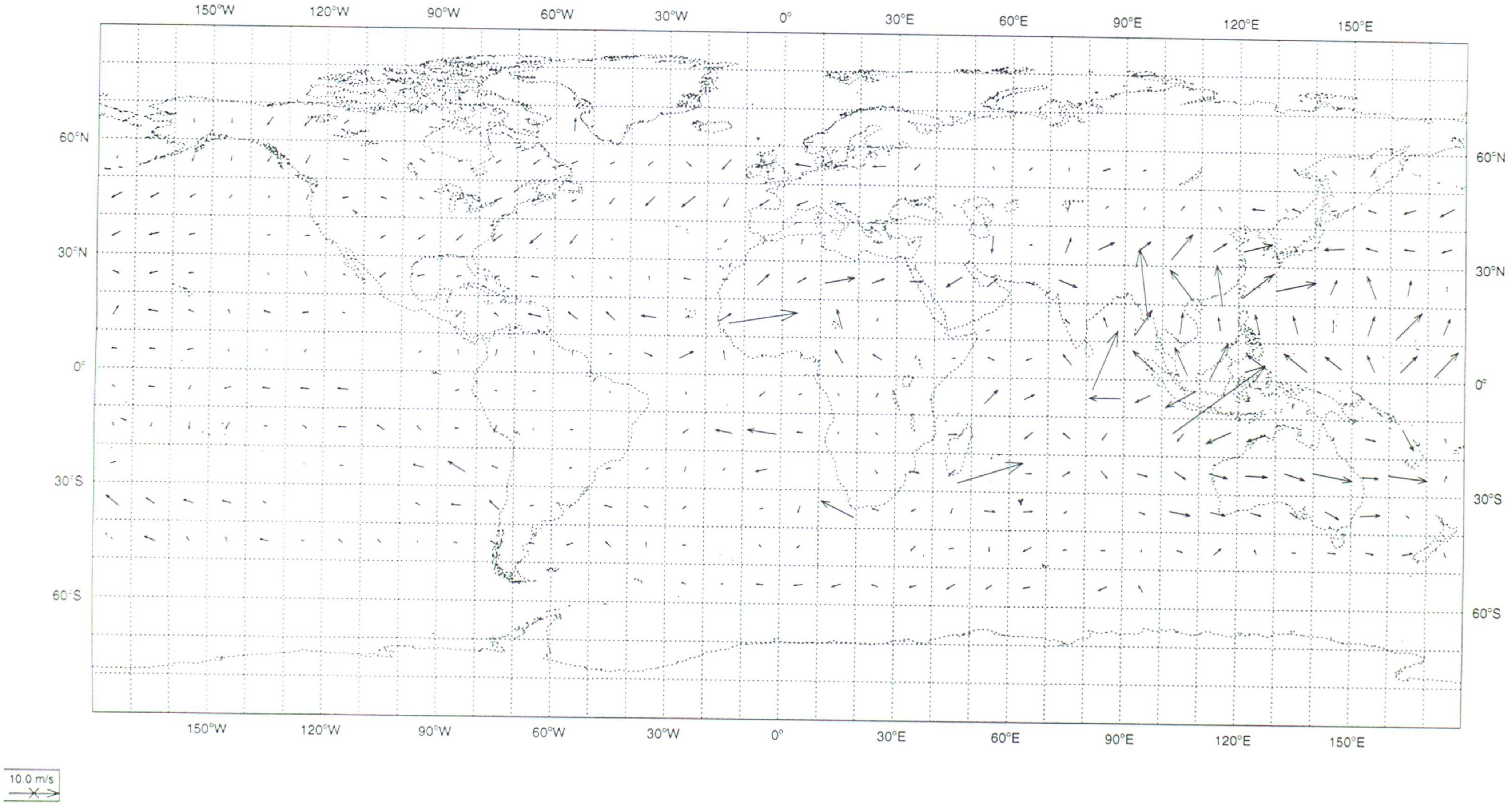

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). FEBRUARY 2002

All observations

Values are plotted where greater than 10 obs are present

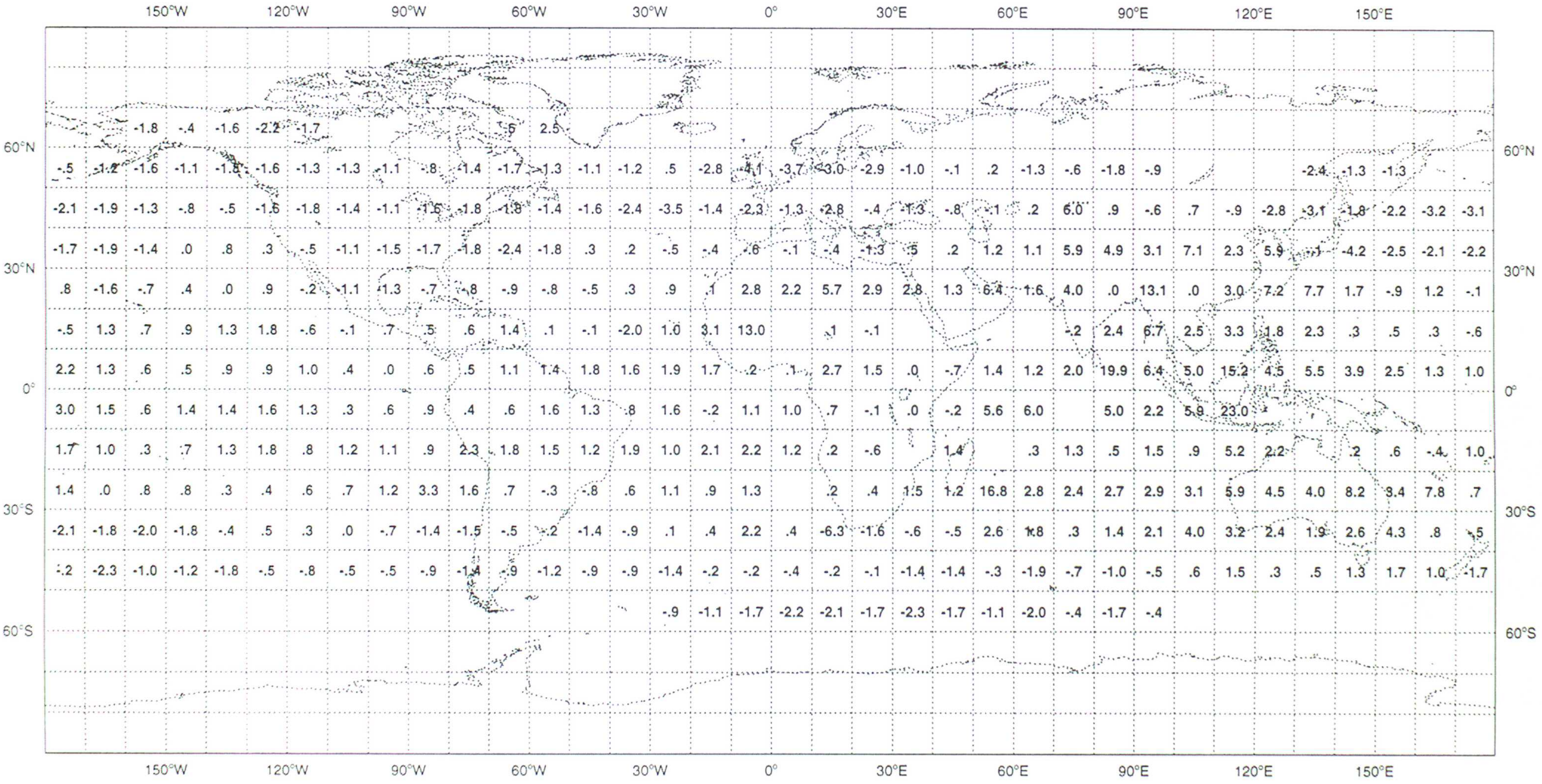

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-1.8 -.4 -1.6 -2.2 -1.7 .5 2.5
-.5 -1.2 -1.6 -1.1 -1.8 -1.6 -1.3 -1.3 -1.1 -.8 -1.4 -1.7 -1.3 -1.1 -1.2 .5 -2.8 -4.1 -3.7 -3.0 -2.9 -1.0 -.1 .2 -1.3 -.6 -1.8 -.9 -2.4 -1.3 -1.3
-2.1 -1.9 -1.3 -.8 -.5 -1.6 -1.8 -1.4 -1.1 -1.6 -1.8 -1.8 -1.4 -1.6 -2.4 -3.5 -1.4 -2.3 -1.3 -2.8 -.4 -1.3 -.8 -.1 .2 6.0 .9 -.6 .7 -.9 -2.8 -3.1 -1.8 -2.2 -3.2 -3.1
-1.7 -1.9 -1.4 .0 .8 .3 -.5 -1.1 -1.5 -1.7 -1.8 -2.4 -1.8 .3 .2 -.5 -.4 -.6 -.1 -.4 -1.3 .5 .2 1.2 1.1 5.9 4.9 3.1 7.1 2.3 5.9 -.1 -4.2 -2.5 -2.1 -2.2
.8 -1.6 -.7 .4 .0 .9 -.2 -1.1 -1.3 -.7 -.8 -.9 -.8 -.5 .3 .9 .1 2.8 2.2 5.7 2.9 2.8 1.3 6.4 1.6 4.0 .0 13.1 .0 3.0 7.2 7.7 1.7 -.9 1.2 -.1
-.5 1.3 .7 .9 1.3 1.8 -.6 -.1 .7 .5 .6 1.4 .1 -.1 -2.0 1.0 3.1 13.0 .1 -.1 -.2 2.4 6.7 2.5 3.3 1.8 2.3 .3 .5 .3 -.6
2.2 1.3 .6 .5 .9 .9 1.0 .4 .0 .6 .5 1.1 1.4 1.8 1.6 1.9 1.7 .2 .1 2.7 1.5 .0 -.7 1.4 1.2 2.0 19.9 6.4 5.0 15.2 4.5 5.5 3.9 2.5 1.3 1.0
3.0 1.5 .6 1.4 1.4 1.6 1.3 .3 .6 .9 .4 .6 1.6 1.3 .8 1.6 -.2 1.1 1.0 .7 -.1 .0 -.2 5.6 6.0 5.0 2.2 5.9 23.0
1.7 1.0 .3 .7 1.3 1.8 .8 1.2 1.1 .9 2.3 1.8 1.5 1.2 1.9 1.0 2.1 2.2 1.2 .2 -.6 1.4 .3 1.3 .5 1.5 .9 5.2 2.2 .2 .6 -.4 1.0
1.4 .0 .8 .8 .3 .4 .6 .7 1.2 3.3 1.6 .7 -.3 -.8 .6 1.1 .9 1.3 .2 .4 1.5 1.2 16.8 2.8 2.4 2.7 2.9 3.1 5.9 4.5 4.0 8.2 3.4 7.8 .7
-2.1 -1.8 -2.0 -1.8 -.4 .5 .3 .0 -.7 -1.4 -1.5 -.5 -.2 -1.4 -.9 .1 .4 2.2 .4 -6.3 -1.6 -.6 -.5 2.6 1.8 .3 1.4 2.1 4.0 3.2 2.4 1.9 2.6 4.3 .8 .5
-.2 -2.3 -1.0 -1.2 -1.8 -.5 -.8 -.5 -.5 -.9 -1.4 -.9 -1.2 -.9 -.9 -1.4 -.2 -.2 -.4 -.2 -.1 -1.4 -1.4 -.3 -1.9 -.7 -1.0 -.5 .6 1.5 .3 .5 1.3 1.7 1.0 -1.7
-.9 -1.1 -1.7 -2.2 -2.1 -1.7 -2.3 -1.7 -1.1 -2.0 -.4 -1.7 -.4

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). FEBRUARY 2002
All observations
Values are plotted where greater than 10 obs are present

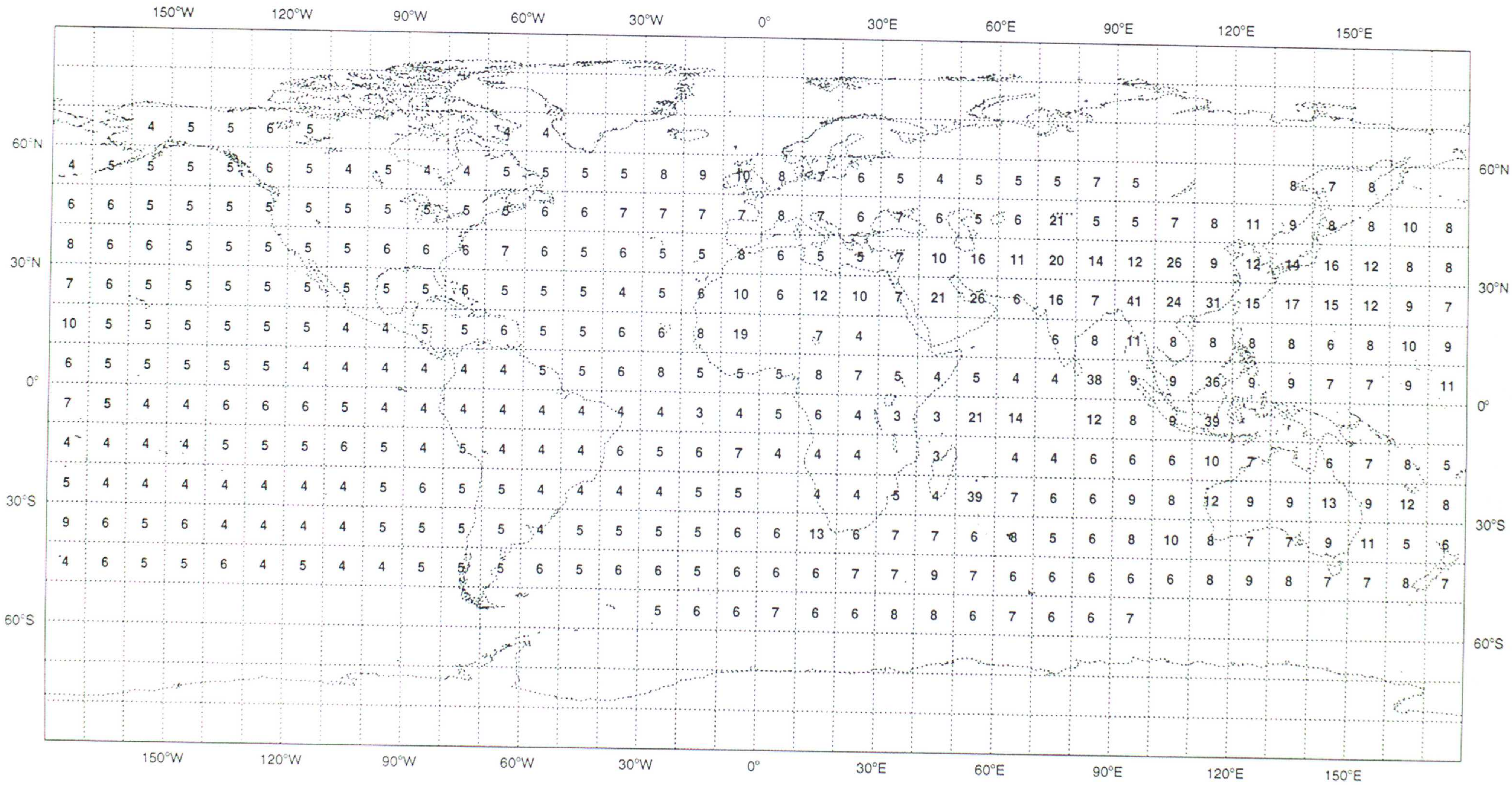

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 20. SATOB 101 - 400 hPa mean daily count. FEBRUARY 2002
Global average number of observations in 24 hours = 68862

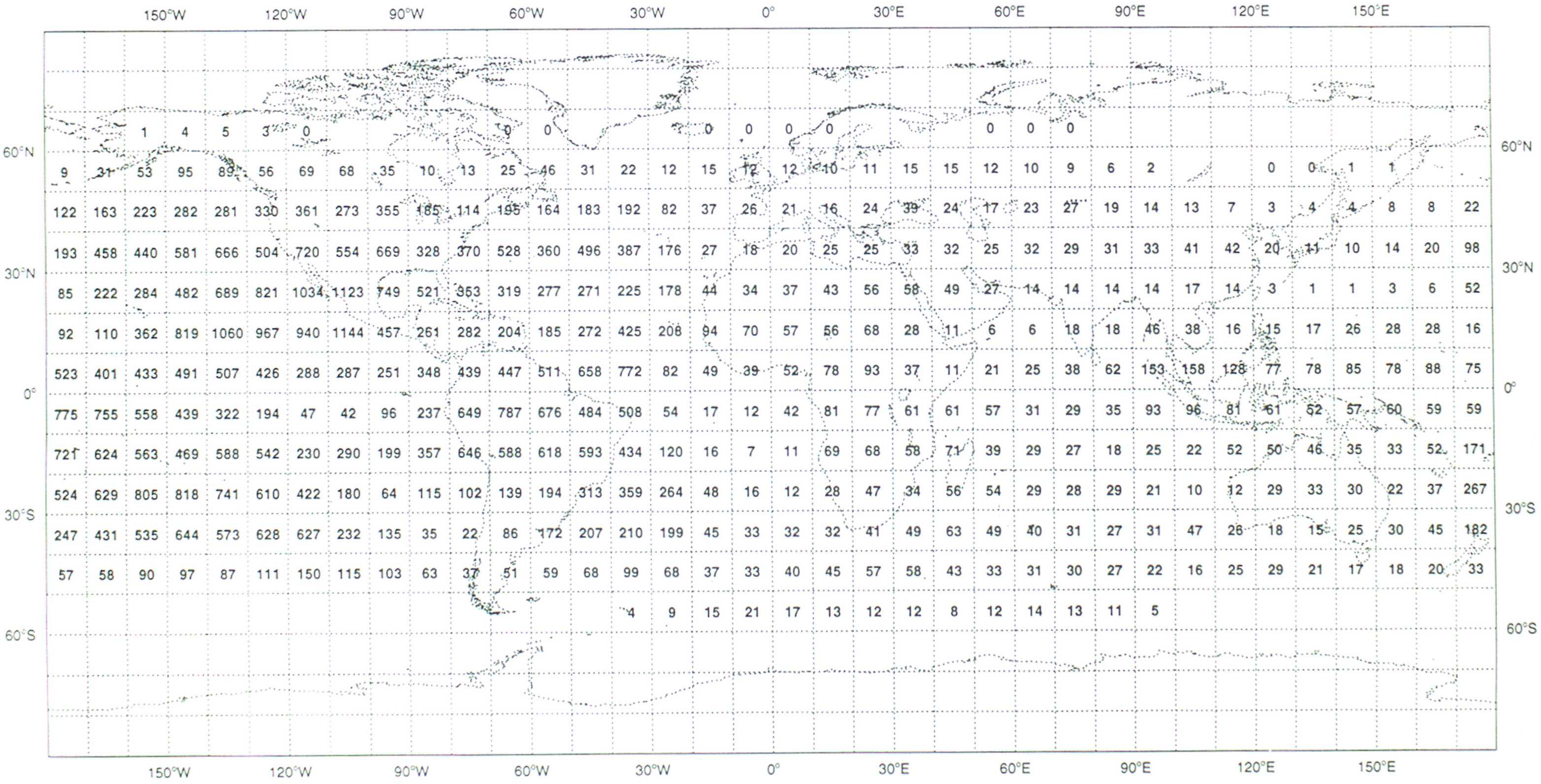

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1 4 5 3 0 0 0 0 0 0 0 0 0 0
9 31 53 95 89 56 69 68 35 10 13 25 46 31 22 12 15 12 12 10 11 15 15 12 10 9 6 2 0 0 1 1
122 163 223 282 281 330 361 273 355 185 114 195 164 183 192 82 37 26 21 16 24 39 24 17 23 27 19 14 13 7 3 4 4 8 8 22
193 458 440 581 666 504 720 554 669 328 370 528 360 496 387 176 27 18 20 25 25 33 32 25 32 29 31 33 41 42 20 11 10 14 20 98
85 222 284 482 689 821 1034 1123 749 521 353 319 277 271 225 178 44 34 37 43 56 58 49 27 14 14 14 14 17 14 3 1 1 3 6 52
92 110 362 819 1060 967 940 1144 457 261 282 204 185 272 425 208 94 70 57 56 68 28 11 6 6 18 18 46 38 16 15 17 26 28 28 16
523 401 433 491 507 426 288 287 251 348 439 447 511 658 772 82 49 39 52 78 93 37 11 21 25 38 62 153 158 128 77 78 85 78 88 75
775 755 558 439 322 194 47 42 96 237 649 787 676 484 508 54 17 12 42 81 77 61 61 57 31 29 35 93 96 81 61 52 57 60 59 59
721 624 563 469 588 542 230 290 199 357 646 588 618 593 434 120 16 7 11 69 68 58 71 39 29 27 18 25 22 52 50 46 35 33 52 171
524 629 805 818 741 610 422 180 64 115 102 139 194 313 359 264 48 16 12 28 47 34 56 54 29 28 29 21 10 12 29 33 30 22 37 267
247 431 535 644 573 628 627 232 135 35 22 86 172 207 210 199 45 33 32 32 41 49 63 49 40 31 27 31 47 26 18 15 25 30 45 182
57 58 90 97 87 111 150 115 103 63 37 51 59 68 99 68 37 33 40 45 57 58 43 33 31 30 27 22 16 25 29 21 17 18 20 33
4 9 15 21 17 13 12 12 8 12 14 13 11 5

Figure 21. SATOB 101 - 400 hPa vector mean wind. FEBRUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

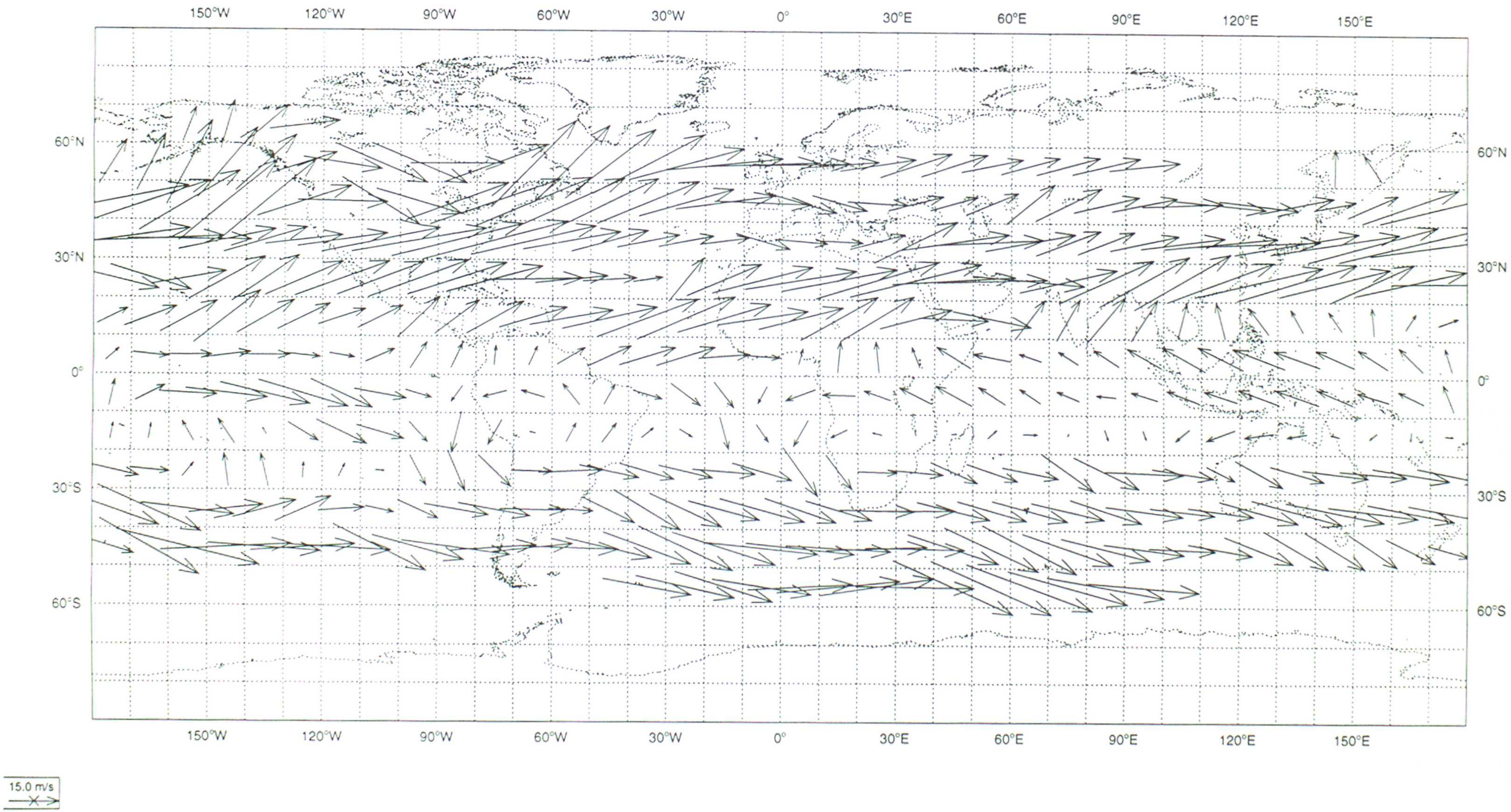

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. FEBRUARY 2002

All observations

Arrows are plotted where greater than 10 obs are present

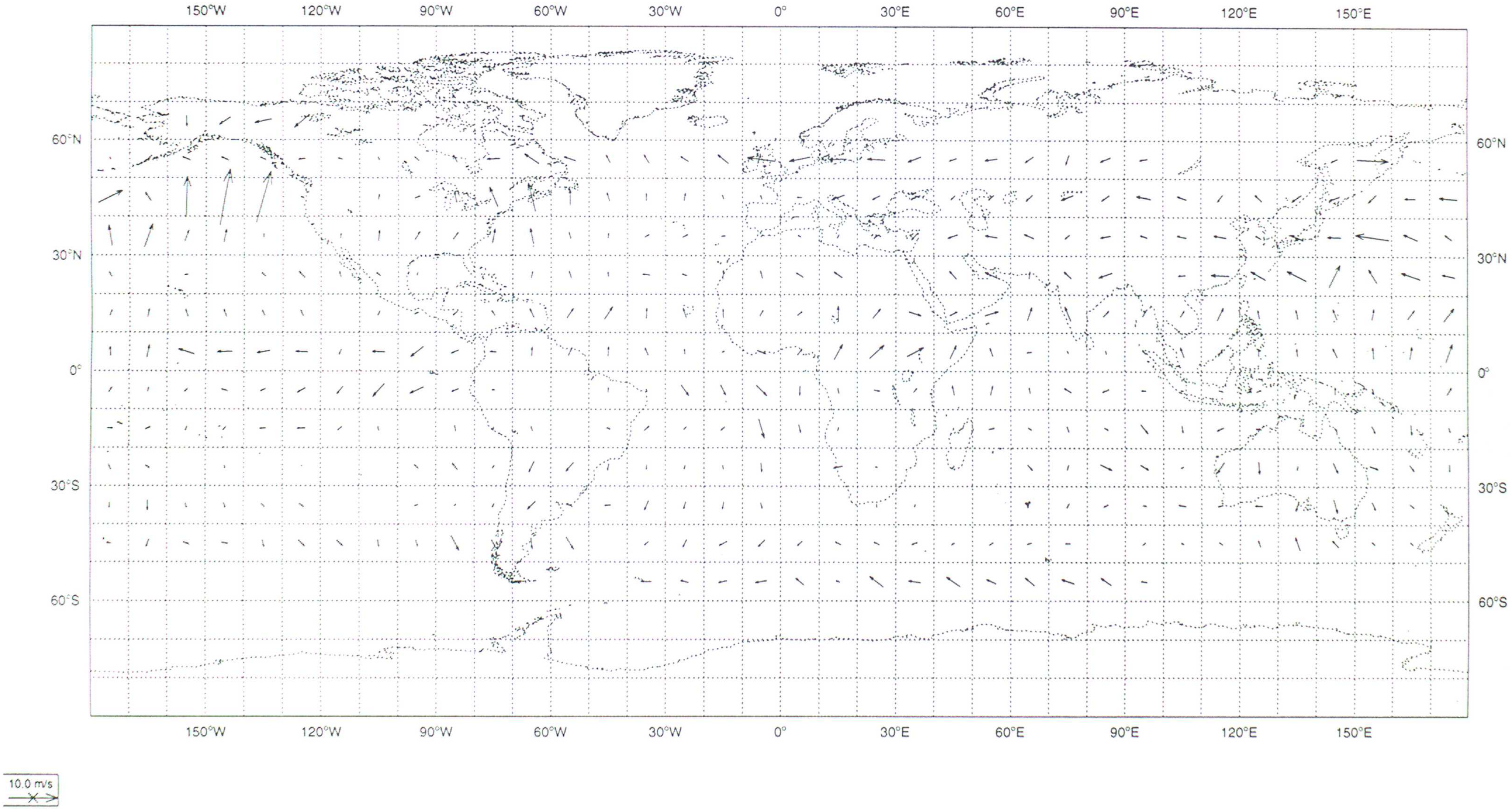

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). FEBRUARY 2002
All observations
Values are plotted where greater than 10 obs are present

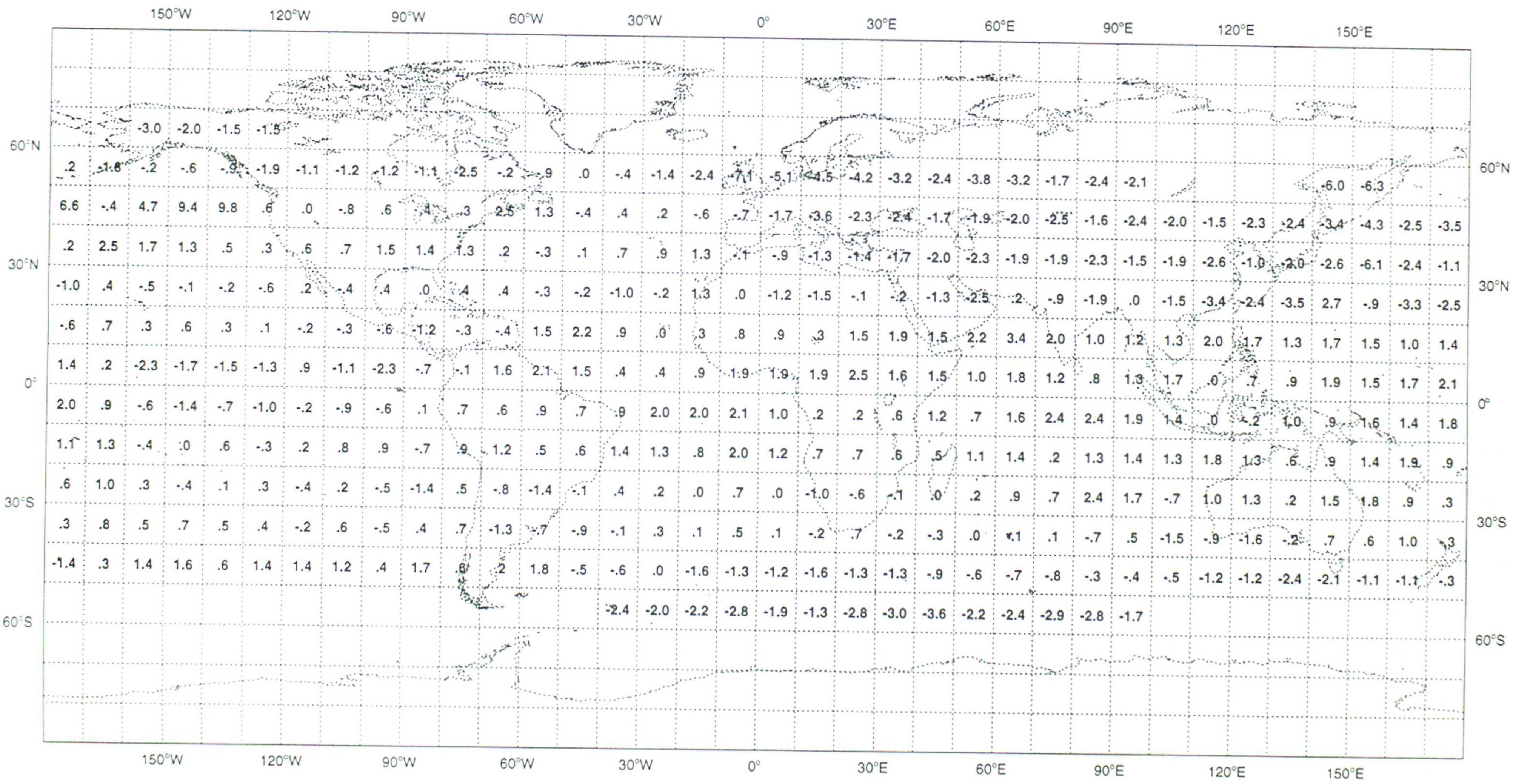
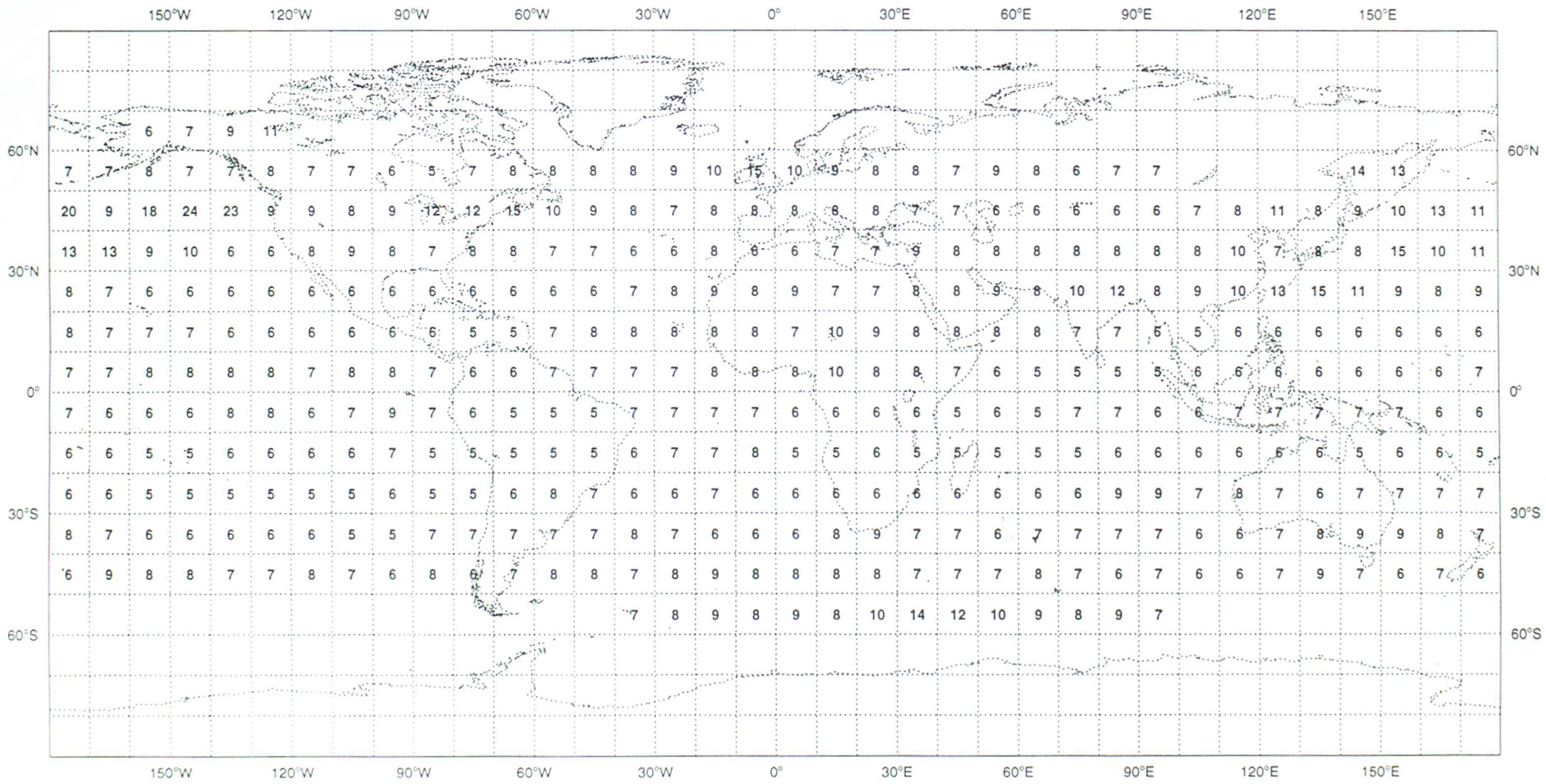

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-3.0 -2.0 -1.5 -1.5
.2 -1.6 -.2 -.6 -.9 -1.9 -1.1 -1.2 -1.2 -1.1 -2.5 -.2 -.9 .0 -.4 -1.4 -2.4 -7.1 -5.1 -4.5 -4.2 -3.2 -2.4 -3.8 -3.2 -1.7 -2.4 -2.1 -6.0 -6.3
6.6 -.4 4.7 9.4 9.8 .6 .0 -.8 .6 .4 .3 2.5 1.3 -.4 .4 .2 -.6 -.7 -1.7 -3.6 -2.3 -2.4 -1.7 -1.9 -2.0 -2.5 -1.6 -2.4 -2.0 -1.5 -2.3 -2.4 -3.4 -4.3 -2.5 -3.5
.2 2.5 1.7 1.3 .5 .3 .6 .7 1.5 1.4 1.3 .2 -.3 .1 .7 .9 1.3 .1 -.9 -1.3 -1.4 -1.7 -2.0 -2.3 -1.9 -1.9 -2.3 -1.5 -1.9 -2.6 -1.0 -2.0 -2.6 -6.1 -2.4 -1.1
-1.0 .4 -.5 -.1 -.2 -.6 .2 -.4 .4 .0 .4 .4 -.3 -.2 -1.0 -.2 1.3 .0 -1.2 -1.5 -.1 -.2 -1.3 -2.5 .2 -.9 -1.9 .0 -1.5 -3.4 -2.4 -3.5 2.7 -.9 -3.3 -2.5
-.6 .7 .3 .6 .3 .1 -.2 -.3 -.6 -1.2 -.3 -.4 1.5 2.2 .9 .0 .3 .8 .9 .3 1.5 1.9 1.5 2.2 3.4 2.0 1.0 1.2 1.3 2.0 1.7 1.3 1.7 1.5 1.0 1.4
1.4 .2 -2.3 -1.7 -1.5 -1.3 .9 -1.1 -2.3 -.7 -.1 1.6 2.1 1.5 .4 .4 .9 1.9 1.9 1.9 2.5 1.6 1.5 1.0 1.8 1.2 .8 1.3 1.7 .0 .7 .9 1.9 1.5 1.7 2.1
2.0 .9 -.6 -1.4 -.7 -1.0 -.2 -.9 -.6 .1 .7 .6 .9 .7 .9 2.0 2.0 2.1 1.0 .2 .2 .6 1.2 .7 1.6 2.4 2.4 1.9 1.4 .0 .2 1.0 .9 1.6 1.4 1.8
1.1 1.3 -.4 .0 .6 -.3 .2 .8 .9 -.7 .9 1.2 .5 .6 1.4 1.3 .8 2.0 1.2 .7 .7 .6 .5 1.1 1.4 .2 1.3 1.4 1.3 1.8 1.3 .6 .9 1.4 1.9 .9
.6 1.0 .3 -.4 .1 .3 -.4 .2 -.5 -1.4 .5 -.8 -1.4 -.1 .4 .2 .0 .7 .0 -1.0 -.6 -.1 .0 .2 .9 .7 2.4 1.7 -.7 1.0 1.3 .2 1.5 1.8 .9 .3
.3 .8 .5 .7 .5 .4 -.2 .6 -.5 .4 .7 -1.3 -.7 -.9 -.1 .3 .1 .5 .1 -.2 .7 -.2 -.3 .0 -.1 .1 -.7 .5 -1.5 -.9 -1.6 -.2 .7 .6 1.0 .3
-1.4 .3 1.4 1.6 .6 1.4 1.4 1.2 .4 1.7 .6 .2 1.8 -.5 -.6 .0 -1.6 -1.3 -1.2 -1.6 -1.3 -1.3 -.9 -.6 -.7 -.8 -.3 -.4 -.5 -1.2 -1.2 -2.4 -2.1 -1.1 -1.1 -.3
-2.4 -2.0 -2.2 -2.8 -1.9 -1.3 -2.8 -3.0 -3.6 -2.2 -2.4 -2.9 -2.8 -1.7

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). FEBRUARY 2002

All observations

Values are plotted where greater than 10 obs are present


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
6 7 9 11
7 7 8 7 7 8 7 7 6 5 7 8 8 8 8 9 10 15 10 9 8 8 7 9 8 6 7 7 14 13
20 9 18 24 23 9 9 8 9 12 12 15 10 9 8 7 8 8 8 8 8 7 7 6 6 6 6 6 7 8 11 8 9 10 13 11
13 13 9 10 6 6 8 9 8 7 8 8 7 7 6 6 8 6 6 7 7 9 8 8 8 8 8 8 8 10 7 8 8 15 10 11
8 7 6 6 6 6 6 6 6 6 6 6 6 6 7 8 9 8 9 7 7 8 8 9 8 10 12 8 9 10 13 15 11 9 8 9
8 7 7 7 6 6 6 6 6 6 5 5 7 8 8 8 8 8 7 10 9 8 8 8 8 7 7 5 5 6 6 6 6 6 6 6
7 7 8 8 8 8 7 8 8 7 6 6 7 7 7 7 8 8 8 10 8 8 7 6 5 5 5 5 6 6 6 6 6 6 6 7
7 6 6 6 8 8 6 7 9 7 6 5 5 5 7 7 7 7 6 6 6 6 5 6 5 7 7 6 6 7 7 7 7 7 6 6
6 6 5 5 6 6 6 6 7 5 5 5 5 5 6 7 7 8 5 5 6 5 5 5 5 5 6 6 6 6 6 6 5 6 6 5
6 6 5 5 5 5 5 5 6 5 5 6 8 7 6 6 7 6 6 6 6 6 6 6 6 9 9 7 8 7 6 7 7 7 7
8 7 6 6 6 6 6 5 5 7 7 7 7 7 8 7 6 6 6 8 9 7 7 6 7 7 7 7 6 6 7 8 9 9 8 7
6 9 8 8 7 7 8 7 6 8 6 7 8 8 7 8 9 8 8 8 8 7 7 7 8 7 6 7 6 6 7 9 7 6 7 6
7 8 9 8 9 8 10 14 12 10 9 8 9 7
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: February 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

Standard of comparison :Background field from UKMO global model.

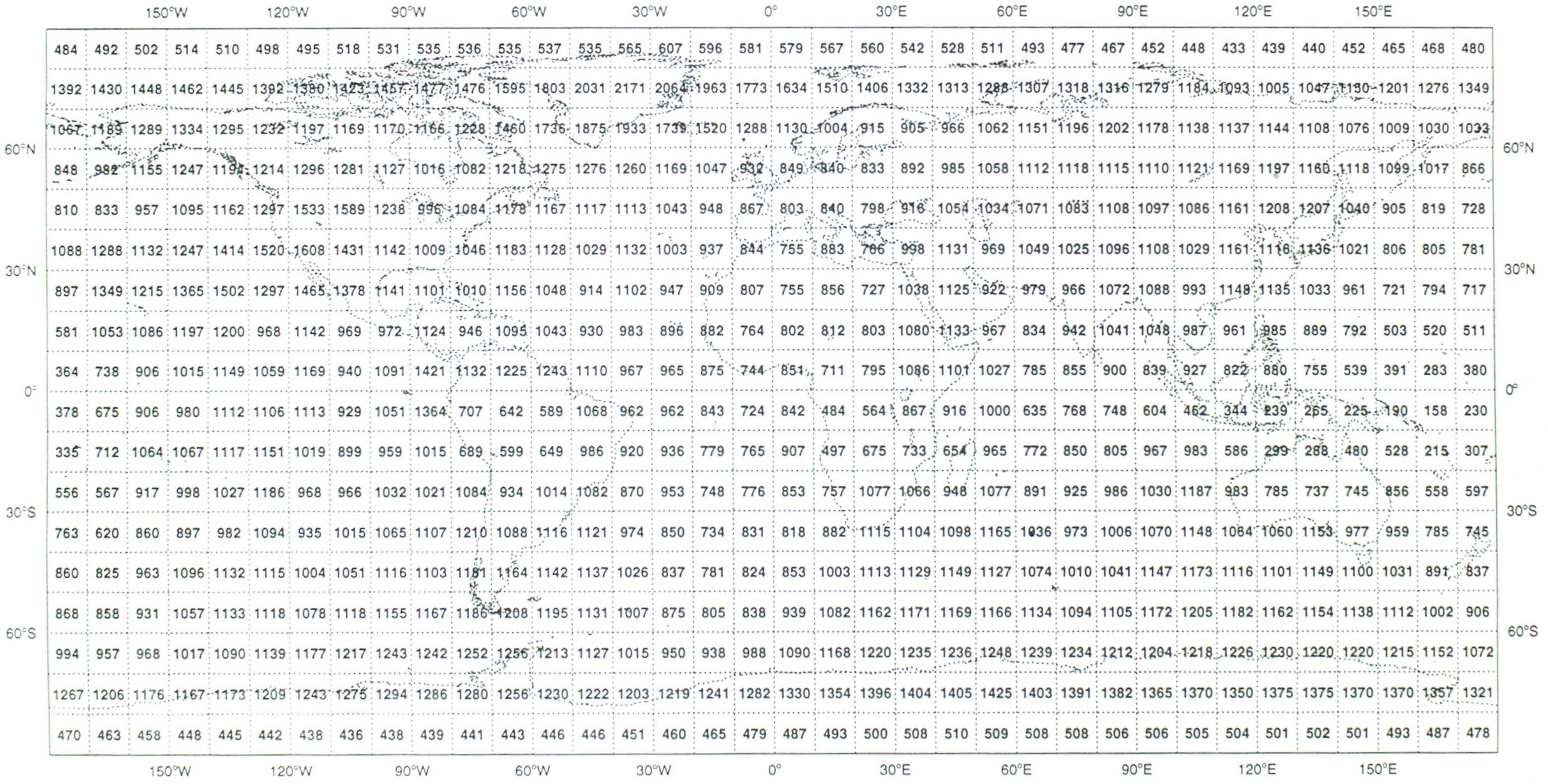
Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

HIRS8 (Surface)
HIRS15 (700)
HIRS11 (500-700)
HIRS4 (400)
AMSUA5 (700)
AMSUA7 (300)
AMSUA9 (100)

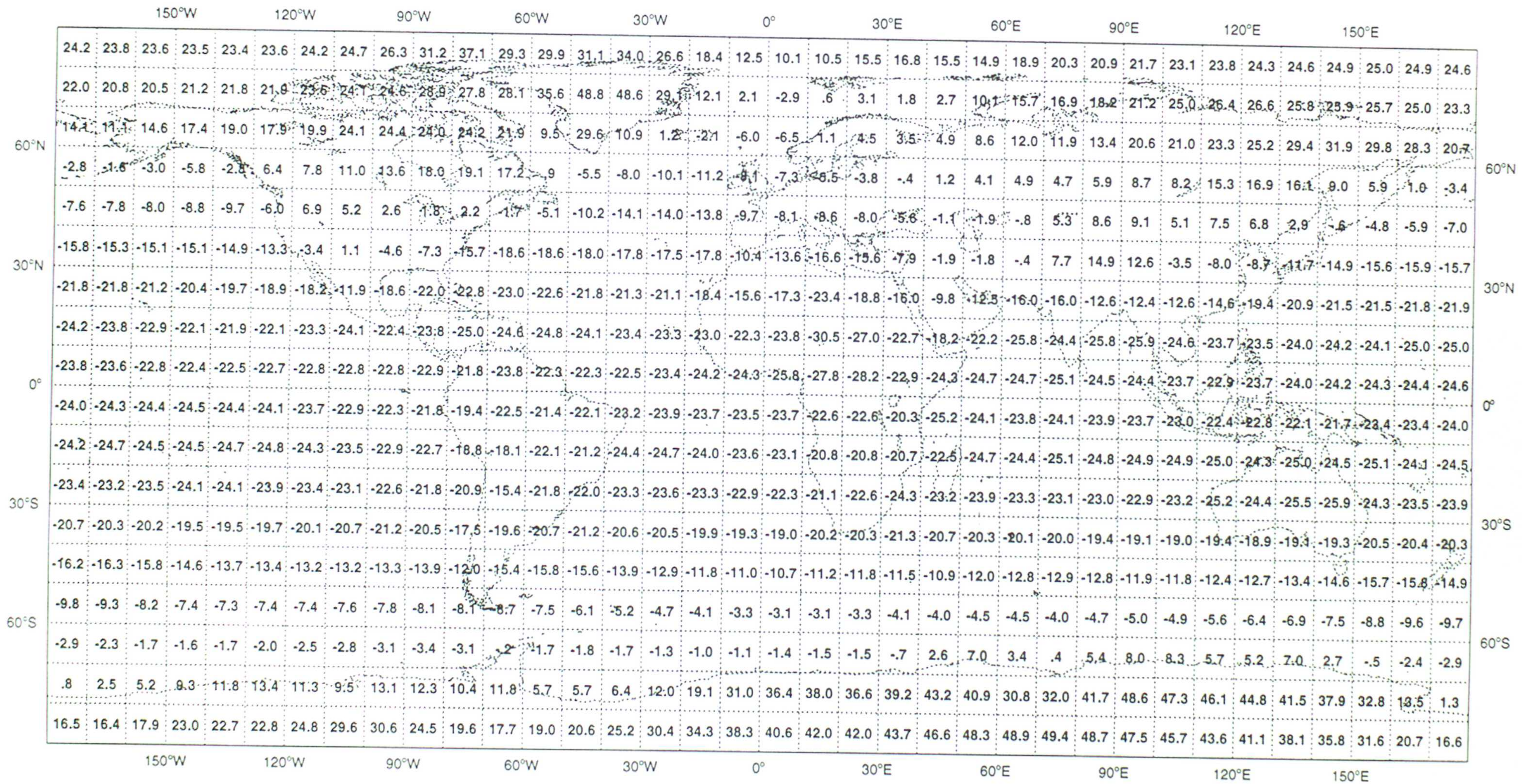
:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. FEBRUARY 2002
NOAA15, using all observations
Global average number of observations in 24 hours = 636709



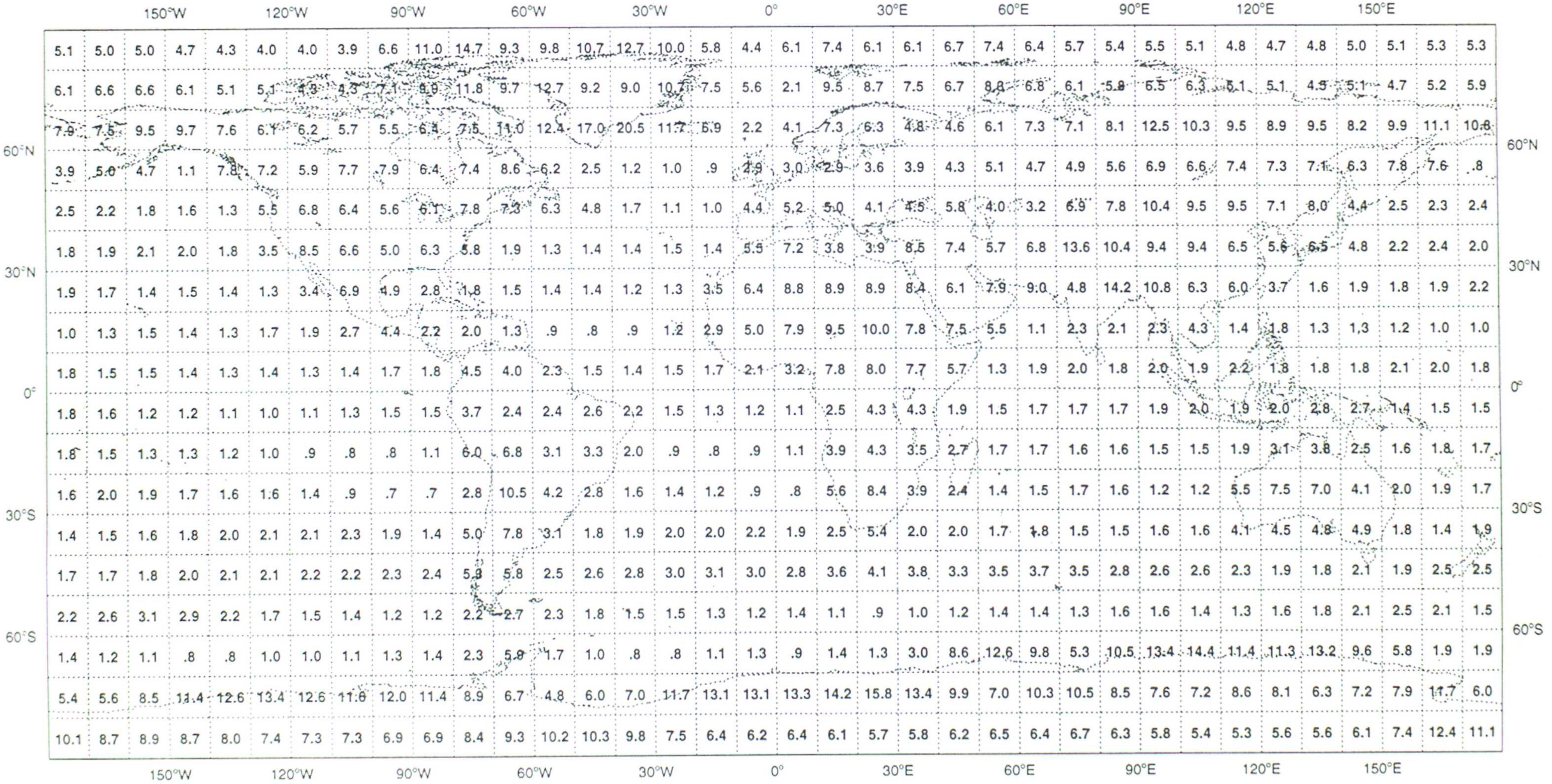
484	492	502	514	510	498	495	518	531	535	536	535	537	535	565	607	596	581	579	567	560	542	528	511	493	477	467	452	448	433	439	440	452	465	468	480
1392	1430	1448	1462	1445	1392	1380	1423	1457	1477	1476	1595	1803	2031	2171	2064	1963	1773	1634	1510	1406	1332	1313	1288	1307	1318	1316	1279	1184	1093	1005	1047	1130	1201	1276	1349
1067	1189	1289	1334	1295	1232	1197	1169	1170	1166	1228	1460	1736	1875	1933	1739	1520	1288	1130	1004	915	905	966	1062	1151	1196	1202	1178	1138	1137	1144	1108	1076	1009	1030	1033
848	982	1155	1247	1194	1214	1296	1281	1127	1016	1082	1218	1275	1276	1260	1169	1047	932	849	840	833	892	985	1058	1112	1118	1115	1110	1121	1169	1197	1160	1118	1099	1017	866
810	833	957	1095	1162	1297	1533	1589	1238	996	1084	1178	1167	1117	1113	1043	948	867	803	840	798	916	1054	1034	1071	1083	1108	1097	1086	1161	1208	1207	1040	905	819	728
1088	1288	1132	1247	1414	1520	1608	1431	1142	1009	1046	1183	1128	1029	1132	1003	937	844	755	883	766	998	1131	969	1049	1025	1096	1108	1029	1161	1116	1136	1021	806	805	781
897	1349	1215	1365	1502	1297	1465	1378	1141	1101	1010	1156	1048	914	1102	947	909	807	755	856	727	1038	1125	922	979	966	1072	1088	993	1148	1135	1033	961	721	794	717
581	1053	1086	1197	1200	968	1142	969	972	1124	946	1095	1043	930	983	896	882	764	802	812	803	1080	1133	967	834	942	1041	1048	987	961	985	889	792	503	520	511
364	738	906	1015	1149	1059	1169	940	1091	1421	1132	1225	1243	1110	967	965	875	744	851	711	795	1086	1101	1027	785	855	900	839	927	822	880	755	539	391	283	380
378	675	906	980	1112	1106	1113	929	1051	1364	707	642	589	1068	962	962	843	724	842	484	564	867	916	1000	635	768	748	604	462	344	239	265	225	190	158	230
335	712	1064	1067	1117	1151	1019	899	959	1015	689	599	649	986	920	936	779	765	907	497	675	733	654	965	772	850	805	967	983	586	299	288	480	528	215	307
556	567	917	998	1027	1186	968	966	1032	1021	1084	934	1014	1082	870	953	748	776	853	757	1077	1066	948	1077	891	925	986	1030	1187	983	785	737	745	856	558	597
763	620	860	897	982	1094	935	1015	1065	1107	1210	1088	1116	1121	974	850	734	831	818	882	1115	1104	1098	1165	1036	973	1006	1070	1148	1084	1060	1153	977	959	785	745
860	825	963	1096	1132	1115	1004	1051	1116	1103	1181	1164	1142	1137	1026	837	781	824	853	1003	1113	1129	1149	1127	1074	1010	1041	1147	1173	1116	1101	1149	1100	1031	891	837
868	858	931	1057	1133	1118	1078	1118	1155	1167	1186	1208	1195	1131	1007	875	805	838	939	1082	1162	1171	1169	1166	1134	1094	1105	1172	1205	1182	1162	1154	1138	1112	1002	906
994	957	968	1017	1090	1139	1177	1217	1243	1242	1252	1256	1213	1127	1015	950	938	988	1090	1168	1220	1235	1236	1248	1239	1234	1212	1204	1218	1226	1230	1220	1220	1215	1152	1072
1267	1206	1176	1167	1173	1209	1243	1275	1294	1286	1280	1256	1230	1222	1203	1219	1241	1282	1330	1354	1396	1404	1405	1425	1403	1391	1382	1365	1370	1350	1375	1375	1370	1370	1357	1321
470	463	458	448	445	442	438	436	438	439	441	443	446	446	451	460	465	479	487	493	500	508	510	509	508	508	506	506	505	504	501	502	501	493	487	478

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



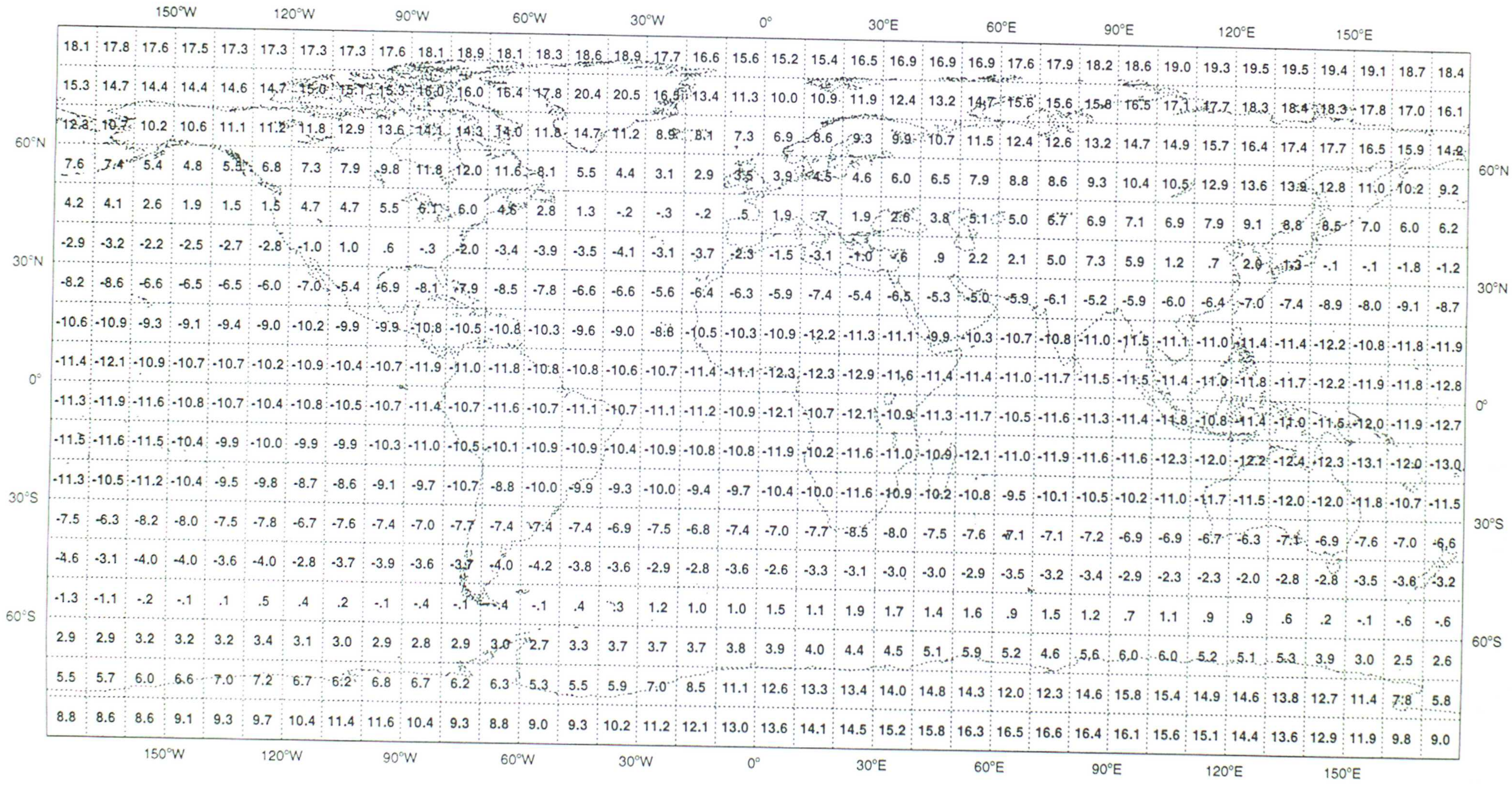
24.2	23.8	23.6	23.5	23.4	23.6	24.2	24.7	26.3	31.2	37.1	29.3	29.9	31.1	34.0	26.6	18.4	12.5	10.1	10.5	15.5	16.8	15.5	14.9	18.9	20.3	20.9	21.7	23.1	23.8	24.3	24.6	24.9	25.0	24.9	24.6
22.0	20.8	20.5	21.2	21.8	21.9	23.6	24.1	24.6	28.9	27.8	28.1	35.6	48.8	48.6	29.1	12.1	2.1	-2.9	.6	3.1	1.8	2.7	10.1	15.7	16.9	18.2	21.2	25.0	26.4	26.6	25.8	25.9	25.7	25.0	23.3
14.1	11.1	14.6	17.4	19.0	17.9	19.9	24.1	24.4	24.0	24.2	21.9	9.5	29.6	10.9	1.2	-2.1	-6.0	-6.5	1.1	4.5	3.5	4.9	8.6	12.0	11.9	13.4	20.6	21.0	23.3	25.2	29.4	31.9	29.8	28.3	20.7
-2.8	-1.6	-3.0	-5.8	-2.8	6.4	7.8	11.0	13.6	18.0	19.1	17.2	.9	-5.5	-8.0	-10.1	-11.2	-8.1	-7.3	-6.5	-3.8	-.4	1.2	4.1	4.9	4.7	5.9	8.7	8.2	15.3	16.9	16.1	9.0	5.9	1.0	-3.4
-7.6	-7.8	-8.0	-8.8	-9.7	-6.0	6.9	5.2	2.6	1.8	2.2	-1.7	-5.1	-10.2	-14.1	-14.0	-13.8	-9.7	-8.1	-8.6	-8.0	-5.6	-1.1	-1.9	-.8	5.3	8.6	9.1	5.1	7.5	6.8	2.9	.6	-4.8	-5.9	-7.0
-15.8	-15.3	-15.1	-15.1	-14.9	-13.3	-3.4	1.1	-4.6	-7.3	-15.7	-18.6	-18.6	-18.0	-17.8	-17.5	-17.8	-10.4	-13.6	-16.6	-15.6	-7.9	-1.9	-1.8	-.4	7.7	14.9	12.6	-3.5	-8.0	-8.7	-11.7	-14.9	-15.6	-15.9	-15.7
-21.8	-21.8	-21.2	-20.4	-19.7	-18.9	-18.2	-11.9	-18.6	-22.0	-22.8	-23.0	-22.6	-21.8	-21.3	-21.1	-18.4	-15.6	-17.3	-23.4	-18.8	-16.0	-9.8	-12.5	-16.0	-16.0	-12.6	-12.4	-12.6	-14.6	-19.4	-20.9	-21.5	-21.5	-21.8	-21.9
-24.2	-23.8	-22.9	-22.1	-21.9	-22.1	-23.3	-24.1	-22.4	-23.8	-25.0	-24.6	-24.8	-24.1	-23.4	-23.3	-23.0	-22.3	-23.8	-30.5	-27.0	-22.7	-18.2	-22.2	-25.8	-24.4	-25.8	-25.9	-24.6	-23.7	-23.5	-24.0	-24.2	-24.1	-25.0	-25.0
-23.8	-23.6	-22.8	-22.4	-22.5	-22.7	-22.8	-22.8	-22.8	-22.9	-21.8	-23.8	-22.3	-22.3	-22.5	-23.4	-24.2	-24.3	-25.8	-27.8	-28.2	-22.9	-24.3	-24.7	-24.7	-25.1	-24.5	-24.4	-23.7	-22.9	-23.7	-24.0	-24.2	-24.3	-24.4	-24.6
-24.0	-24.3	-24.4	-24.5	-24.4	-24.1	-23.7	-22.9	-22.3	-21.8	-19.4	-22.5	-21.4	-22.1	-23.2	-23.9	-23.7	-23.5	-23.7	-22.6	-22.6	-20.3	-25.2	-24.1	-23.8	-24.1	-23.9	-23.7	-23.0	-22.4	-22.8	-22.1	-21.7	-23.4	-23.4	-24.0
-24.2	-24.7	-24.5	-24.5	-24.7	-24.8	-24.3	-23.5	-22.9	-22.7	-18.8	-18.1	-22.1	-21.2	-24.4	-24.7	-24.0	-23.6	-23.1	-20.8	-20.8	-20.7	-22.5	-24.7	-24.4	-25.1	-24.8	-24.9	-24.9	-25.0	-24.3	-25.0	-24.5	-25.1	-24.1	-24.5
-23.4	-23.2	-23.5	-24.1	-24.1	-23.9	-23.4	-23.1	-22.6	-21.8	-20.9	-15.4	-21.8	-22.0	-23.3	-23.6	-23.3	-22.9	-22.3	-21.1	-22.6	-24.3	-23.2	-23.9	-23.3	-23.1	-23.0	-22.9	-23.2	-25.2	-24.4	-25.5	-25.9	-24.3	-23.5	-23.9
-20.7	-20.3	-20.2	-19.5	-19.5	-19.7	-20.1	-20.7	-21.2	-20.5	-17.5	-19.6	-20.7	-21.2	-20.6	-20.5	-19.9	-19.3	-19.0	-20.2	-20.3	-21.3	-20.7	-20.3	-20.1	-20.0	-19.4	-19.1	-19.0	-19.4	-18.9	-19.1	-19.3	-20.5	-20.4	-20.3
-16.2	-16.3	-15.8	-14.6	-13.7	-13.4	-13.2	-13.2	-13.3	-13.9	-12.0	-15.4	-15.8	-15.6	-13.9	-12.9	-11.8	-11.0	-10.7	-11.2	-11.8	-11.5	-10.9	-12.0	-12.8	-12.9	-12.8	-11.9	-11.8	-12.4	-12.7	-13.4	-14.6	-15.7	-15.8	-14.9
-9.8	-9.3	-8.2	-7.4	-7.3	-7.4	-7.4	-7.6	-7.8	-8.1	-8.1	-8.7	-7.5	-6.1	-5.2	-4.7	-4.1	-3.3	-3.1	-3.1	-3.3	-4.1	-4.0	-4.5	-4.5	-4.0	-4.7	-5.0	-4.9	-5.6	-6.4	-6.9	-7.5	-8.8	-9.6	-9.7
-2.9	-2.3	-1.7	-1.6	-1.7	-2.0	-2.5	-2.8	-3.1	-3.4	-3.1	.2	-1.7	-1.8	-1.7	-1.3	-1.0	-1.1	-1.4	-1.5	-1.5	-.7	2.6	7.0	3.4	.4	5.4	8.0	8.3	5.7	5.2	7.0	2.7	-.5	-2.4	-2.9
.8	2.5	5.2	9.3	11.8	13.4	11.3	9.5	13.1	12.3	10.4	11.8	5.7	5.7	6.4	12.0	19.1	31.0	36.4	38.0	36.6	39.2	43.2	40.9	30.8	32.0	41.7	48.6	47.3	46.1	44.8	41.5	37.9	32.8	13.5	1.3
16.5	16.4	17.9	23.0	22.7	22.8	24.8	29.6	30.6	24.5	19.6	17.7	19.0	20.6	25.2	30.4	34.3	38.3	40.6	42.0	42.0	43.7	46.6	48.3	48.9	49.4	48.7	47.5	45.7	43.6	41.1	38.1	35.8	31.6	20.7	16.6

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



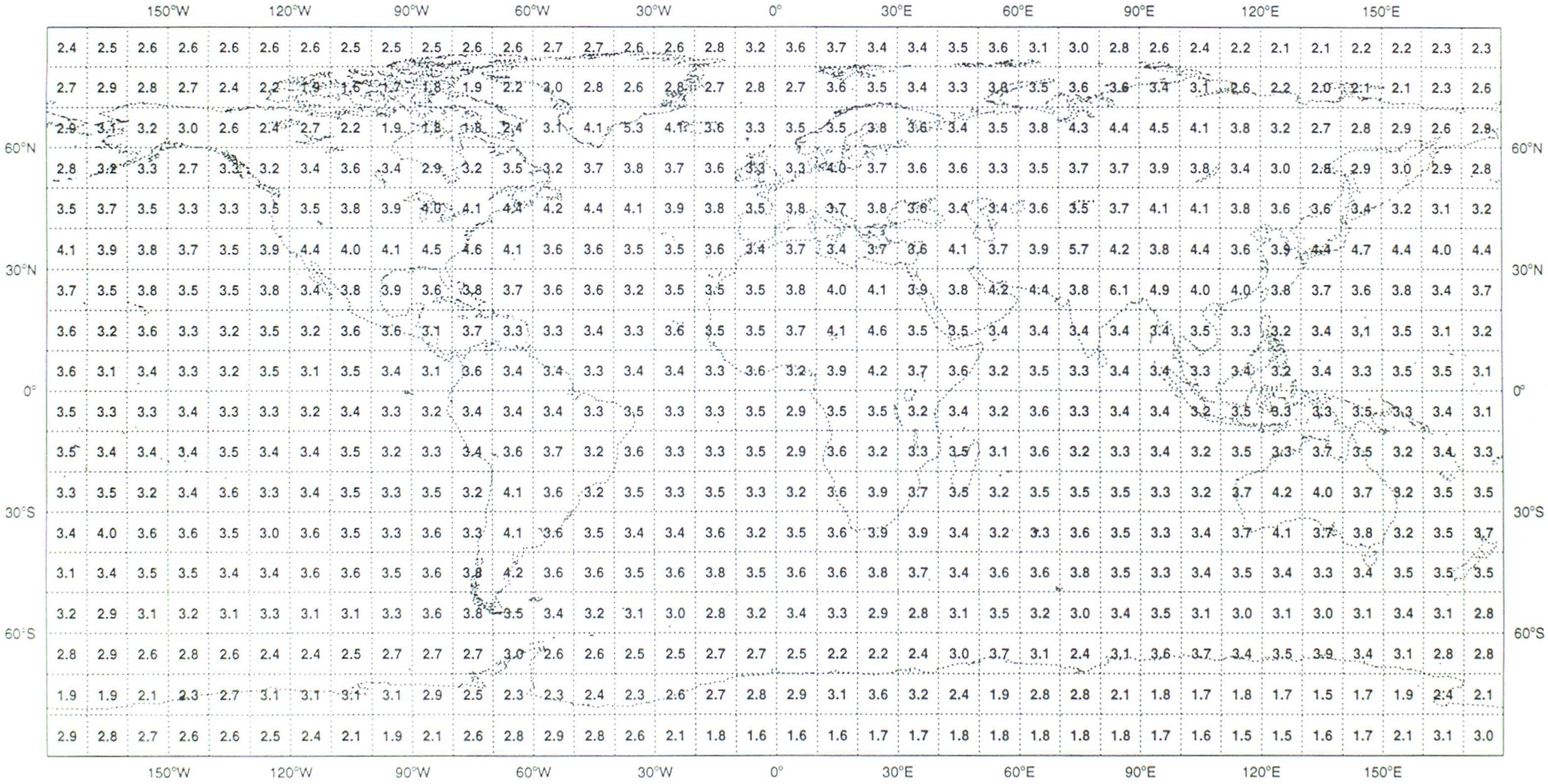
5.1	5.0	5.0	4.7	4.3	4.0	4.0	3.9	6.6	11.0	14.7	9.3	9.8	10.7	12.7	10.0	5.8	4.4	6.1	7.4	6.1	6.1	6.7	7.4	6.4	5.7	5.4	5.5	5.1	4.8	4.7	4.8	5.0	5.1	5.3	5.3
6.1	6.6	6.6	6.1	5.1	5.1	4.3	4.3	7.1	8.9	11.8	9.7	12.7	9.2	9.0	10.7	7.5	5.6	2.1	9.5	8.7	7.5	6.7	8.8	6.8	6.1	5.8	6.5	6.3	5.1	5.1	4.5	5.1	4.7	5.2	5.9
7.9	7.5	9.5	9.7	7.6	6.1	6.2	5.7	5.5	6.4	7.5	11.0	12.4	17.0	20.5	11.7	6.9	2.2	4.1	7.3	6.3	4.8	4.6	6.1	7.3	7.1	8.1	12.5	10.3	9.5	8.9	9.5	8.2	9.9	11.1	10.8
3.9	5.0	4.7	1.1	7.8	7.2	5.9	7.7	7.9	6.4	7.4	8.6	6.2	2.5	1.2	1.0	.9	2.9	3.0	2.9	3.6	3.9	4.3	5.1	4.7	4.9	5.6	6.9	6.6	7.4	7.3	7.1	6.3	7.8	7.6	.8
2.5	2.2	1.8	1.6	1.3	5.5	6.8	6.4	5.6	6.1	7.8	7.3	6.3	4.8	1.7	1.1	1.0	4.4	5.2	5.0	4.1	4.5	5.8	4.0	3.2	6.9	7.8	10.4	9.5	9.5	7.1	8.0	4.4	2.5	2.3	2.4
1.8	1.9	2.1	2.0	1.8	3.5	8.5	6.6	5.0	6.3	5.8	1.9	1.3	1.4	1.4	1.5	1.4	5.5	7.2	3.8	3.9	8.5	7.4	5.7	6.8	13.6	10.4	9.4	9.4	6.5	5.6	6.5	4.8	2.2	2.4	2.0
1.9	1.7	1.4	1.5	1.4	1.3	3.4	6.9	4.9	2.8	1.8	1.5	1.4	1.4	1.2	1.3	3.5	6.4	8.8	8.9	8.9	8.4	6.1	7.9	9.0	4.8	14.2	10.8	6.3	6.0	3.7	1.6	1.9	1.8	1.9	2.2
1.0	1.3	1.5	1.4	1.3	1.7	1.9	2.7	4.4	2.2	2.0	1.3	.9	.8	.9	1.2	2.9	5.0	7.9	9.5	10.0	7.8	7.5	5.5	1.1	2.3	2.1	2.3	4.3	1.4	1.8	1.3	1.3	1.2	1.0	1.0
1.8	1.5	1.5	1.4	1.3	1.4	1.3	1.4	1.7	1.8	4.5	4.0	2.3	1.5	1.4	1.5	1.7	2.1	3.2	7.8	8.0	7.7	5.7	1.3	1.9	2.0	1.8	2.0	1.9	2.2	1.8	1.8	1.8	2.1	2.0	1.8
1.8	1.6	1.2	1.2	1.1	1.0	1.1	1.3	1.5	1.5	3.7	2.4	2.4	2.6	2.2	1.5	1.3	1.2	1.1	2.5	4.3	4.3	1.9	1.5	1.7	1.7	1.7	1.9	2.0	1.9	2.0	2.8	2.7	1.4	1.5	1.5
1.8	1.5	1.3	1.3	1.2	1.0	.9	.8	.8	1.1	6.0	6.8	3.1	3.3	2.0	.9	.8	.9	1.1	3.9	4.3	3.5	2.7	1.7	1.7	1.6	1.6	1.5	1.5	1.9	3.1	3.8	2.5	1.6	1.8	1.7
1.6	2.0	1.9	1.7	1.6	1.6	1.4	.9	.7	.7	2.8	10.5	4.2	2.8	1.6	1.4	1.2	.9	.8	5.6	8.4	3.9	2.4	1.4	1.5	1.7	1.6	1.2	1.2	5.5	7.5	7.0	4.1	2.0	1.9	1.7
1.4	1.5	1.6	1.8	2.0	2.1	2.1	2.3	1.9	1.4	5.0	7.8	3.1	1.8	1.9	2.0	2.0	2.2	1.9	2.5	5.4	2.0	2.0	1.7	1.8	1.5	1.5	1.6	1.6	4.1	4.5	4.8	4.9	1.8	1.4	1.9
1.7	1.7	1.8	2.0	2.1	2.1	2.2	2.2	2.3	2.4	5.3	5.8	2.5	2.6	2.8	3.0	3.1	3.0	2.8	3.6	4.1	3.8	3.3	3.5	3.7	3.5	2.8	2.6	2.6	2.3	1.9	1.8	2.1	1.9	2.5	2.5
2.2	2.6	3.1	2.9	2.2	1.7	1.5	1.4	1.2	1.2	2.2	2.7	2.3	1.8	1.5	1.5	1.3	1.2	1.4	1.1	.9	1.0	1.2	1.4	1.4	1.3	1.6	1.6	1.4	1.3	1.6	1.8	2.1	2.5	2.1	1.5
1.4	1.2	1.1	.8	.8	1.0	1.0	1.1	1.3	1.4	2.3	5.9	1.7	1.0	.8	.8	1.1	1.3	.9	1.4	1.3	3.0	8.6	12.6	9.8	5.3	10.5	13.4	14.4	11.4	11.3	13.2	9.6	5.8	1.9	1.9
5.4	5.6	8.5	11.4	12.6	13.4	12.6	11.6	12.0	11.4	8.9	6.7	4.8	6.0	7.0	11.7	13.1	13.1	13.3	14.2	15.8	13.4	9.9	7.0	10.3	10.5	8.5	7.6	7.2	8.6	8.1	6.3	7.2	7.9	11.7	6.0
10.1	8.7	8.9	8.7	8.0	7.4	7.3	7.3	6.9	6.9	8.4	9.3	10.2	10.3	9.8	7.5	6.4	6.2	6.4	6.1	5.7	5.8	6.2	6.5	6.4	6.7	6.3	5.8	5.4	5.3	5.6	5.6	6.1	7.4	12.4	11.1

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



18.1	17.8	17.6	17.5	17.3	17.3	17.3	17.3	17.6	18.1	18.9	18.1	18.3	18.6	18.9	17.7	16.6	15.6	15.2	15.4	16.5	16.9	16.9	16.9	17.6	17.9	18.2	18.6	19.0	19.3	19.5	19.5	19.4	19.1	18.7	18.4
15.3	14.7	14.4	14.4	14.6	14.7	15.0	15.1	15.3	16.0	16.0	16.4	17.8	20.4	20.5	16.5	13.4	11.3	10.0	10.9	11.9	12.4	13.2	14.7	15.6	15.6	15.8	16.5	17.1	17.7	18.3	18.4	18.3	17.8	17.0	16.1
12.3	10.7	10.2	10.6	11.1	11.2	11.8	12.9	13.6	14.1	14.3	14.0	11.8	14.7	11.2	8.9	8.1	7.3	6.9	8.6	9.3	9.9	10.7	11.5	12.4	12.6	13.2	14.7	14.9	15.7	16.4	17.4	17.7	16.5	15.9	14.2
7.6	7.4	5.4	4.8	5.5	6.8	7.3	7.9	9.8	11.8	12.0	11.6	8.1	5.5	4.4	3.1	2.9	3.5	3.9	4.5	4.6	6.0	6.5	7.9	8.8	8.6	9.3	10.4	10.5	12.9	13.6	13.9	12.8	11.0	10.2	9.2
4.2	4.1	2.6	1.9	1.5	1.5	4.7	4.7	5.5	6.1	6.0	4.6	2.8	1.3	-.2	-.3	-.2	.5	1.9	.7	1.9	2.6	3.8	5.1	5.0	6.7	6.9	7.1	6.9	7.9	9.1	8.8	8.5	7.0	6.0	6.2
-2.9	-3.2	-2.2	-2.5	-2.7	-2.8	-1.0	1.0	.6	-.3	-2.0	-3.4	-3.9	-3.5	-4.1	-3.1	-3.7	-2.3	-1.5	-3.1	-1.0	-.6	.9	2.2	2.1	5.0	7.3	5.9	1.2	.7	2.0	1.3	-.1	-.1	-1.8	-1.2
-8.2	-8.6	-6.6	-6.5	-6.5	-6.0	-7.0	-5.4	-6.9	-8.1	-7.9	-8.5	-7.8	-6.6	-6.6	-5.6	-6.4	-6.3	-5.9	-7.4	-5.4	-6.5	-5.3	-5.0	-5.9	-6.1	-5.2	-5.9	-6.0	-6.4	-7.0	-7.4	-8.9	-8.0	-9.1	-8.7
-10.6	-10.9	-9.3	-9.1	-9.4	-9.0	-10.2	-9.9	-9.9	-10.8	-10.5	-10.8	-10.3	-9.6	-9.0	-8.8	-10.5	-10.3	-10.9	-12.2	-11.3	-11.1	-9.9	-10.3	-10.7	-10.8	-11.0	-11.5	-11.1	-11.0	-11.4	-11.4	-12.2	-10.8	-11.8	-11.9
-11.4	-12.1	-10.9	-10.7	-10.7	-10.2	-10.9	-10.4	-10.7	-11.9	-11.0	-11.8	-10.8	-10.8	-10.6	-10.7	-11.4	-11.1	-12.3	-12.3	-12.9	-11.6	-11.4	-11.4	-11.0	-11.7	-11.5	-11.5	-11.4	-11.0	-11.8	-11.7	-12.2	-11.9	-11.8	-12.8
-11.3	-11.9	-11.6	-10.8	-10.7	-10.4	-10.8	-10.5	-10.7	-11.4	-10.7	-11.6	-10.7	-11.1	-10.7	-11.1	-11.2	-10.9	-12.1	-10.7	-12.1	-10.9	-11.3	-11.7	-10.5	-11.6	-11.3	-11.4	-11.8	-10.8	-11.4	-11.0	-11.5	-12.0	-11.9	-12.7
-11.5	-11.6	-11.5	-10.4	-9.9	-10.0	-9.9	-9.9	-10.3	-11.0	-10.5	-10.1	-10.9	-10.9	-10.4	-10.9	-10.8	-10.8	-11.9	-10.2	-11.6	-11.0	-10.9	-12.1	-11.0	-11.9	-11.6	-11.6	-12.3	-12.0	-12.2	-12.4	-12.3	-13.1	-12.0	-13.0
-11.3	-10.5	-11.2	-10.4	-9.5	-9.8	-8.7	-8.6	-9.1	-9.7	-10.7	-8.8	-10.0	-9.9	-9.3	-10.0	-9.4	-9.7	-10.4	-10.0	-11.6	-10.9	-10.2	-10.8	-9.5	-10.1	-10.5	-10.2	-11.0	-11.7	-11.5	-12.0	-12.0	-11.8	-10.7	-11.5
-7.5	-6.3	-8.2	-8.0	-7.5	-7.8	-6.7	-7.6	-7.4	-7.0	-7.7	-7.4	-7.4	-7.4	-6.9	-7.5	-6.8	-7.4	-7.0	-7.7	-8.5	-8.0	-7.5	-7.6	-7.1	-7.1	-7.2	-6.9	-6.9	-6.7	-6.3	-7.1	-6.9	-7.6	-7.0	-6.6
-4.6	-3.1	-4.0	-4.0	-3.6	-4.0	-2.8	-3.7	-3.9	-3.6	-3.7	-4.0	-4.2	-3.8	-3.6	-2.9	-2.8	-3.6	-2.6	-3.3	-3.1	-3.0	-3.0	-2.9	-3.5	-3.2	-3.4	-2.9	-2.3	-2.3	-2.0	-2.8	-2.8	-3.5	-3.6	-3.2
-1.3	-1.1	-.2	-.1	.1	.5	.4	.2	-.1	-.4	-.1	.4	-.1	.4	.3	1.2	1.0	1.0	1.5	1.1	1.9	1.7	1.4	1.6	.9	1.5	1.2	.7	1.1	.9	.9	.6	.2	-.1	-.6	-.6
2.9	2.9	3.2	3.2	3.2	3.4	3.1	3.0	2.9	2.8	2.9	3.0	2.7	3.3	3.7	3.7	3.7	3.8	3.9	4.0	4.4	4.5	5.1	5.9	5.2	4.6	5.6	6.0	6.0	5.2	5.1	5.3	3.9	3.0	2.5	2.6
5.5	5.7	6.0	6.6	7.0	7.2	6.7	6.2	6.8	6.7	6.2	6.3	5.3	5.5	5.9	7.0	8.5	11.1	12.6	13.3	13.4	14.0	14.8	14.3	12.0	12.3	14.6	15.8	15.4	14.9	14.6	13.8	12.7	11.4	7.8	5.8
8.8	8.6	8.6	9.1	9.3	9.7	10.4	11.4	11.6	10.4	9.3	8.8	9.0	9.3	10.2	11.2	12.1	13.0	13.6	14.1	14.5	15.2	15.8	16.3	16.5	16.6	16.4	16.1	15.6	15.1	14.4	13.6	12.9	11.9	9.8	9.0

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.5	2.5	2.5	2.6	2.6	2.7	2.7	2.6	2.6	2.8	3.2	3.6	3.7	3.4	3.4	3.5	3.6	3.1	3.0	2.8	2.6	2.4	2.2	2.1	2.1	2.2	2.2	2.3	2.3
2.7	2.9	2.8	2.7	2.4	2.2	1.9	1.6	1.7	1.8	1.9	2.2	3.0	2.8	2.6	2.8	2.7	2.8	2.7	3.6	3.5	3.4	3.3	3.8	3.5	3.6	3.6	3.4	3.1	2.6	2.2	2.0	2.1	2.1	2.3	2.6
2.9	3.1	3.2	3.0	2.6	2.4	2.7	2.2	1.9	1.8	1.8	2.4	3.1	4.1	5.3	4.1	3.6	3.3	3.5	3.5	3.8	3.6	3.4	3.5	3.8	4.3	4.4	4.5	4.1	3.8	3.2	2.7	2.8	2.9	2.6	2.8
2.8	3.2	3.3	2.7	3.3	3.2	3.4	3.6	3.4	2.9	3.2	3.5	3.2	3.7	3.8	3.7	3.6	3.3	3.3	4.0	3.7	3.6	3.6	3.3	3.5	3.7	3.7	3.9	3.8	3.4	3.0	2.8	2.9	3.0	2.9	2.8
3.5	3.7	3.5	3.3	3.3	3.5	3.5	3.8	3.9	4.0	4.1	4.4	4.2	4.4	4.1	3.9	3.8	3.5	3.8	3.7	3.8	3.6	3.4	3.4	3.6	3.5	3.7	4.1	4.1	3.8	3.6	3.6	3.4	3.2	3.1	3.2
4.1	3.9	3.8	3.7	3.5	3.9	4.4	4.0	4.1	4.5	4.6	4.1	3.6	3.6	3.5	3.5	3.6	3.4	3.7	3.4	3.7	3.6	4.1	3.7	3.9	5.7	4.2	3.8	4.4	3.6	3.9	4.4	4.7	4.4	4.0	4.4
3.7	3.5	3.8	3.5	3.5	3.8	3.4	3.8	3.9	3.6	3.8	3.7	3.6	3.6	3.2	3.5	3.5	3.5	3.8	4.0	4.1	3.9	3.8	4.2	4.4	3.8	6.1	4.9	4.0	4.0	3.8	3.7	3.6	3.8	3.4	3.7
3.6	3.2	3.6	3.3	3.2	3.5	3.2	3.6	3.6	3.1	3.7	3.3	3.3	3.4	3.3	3.6	3.5	3.5	3.7	4.1	4.6	3.5	3.5	3.4	3.4	3.4	3.4	3.4	3.5	3.3	3.2	3.4	3.1	3.5	3.1	3.2
3.6	3.1	3.4	3.3	3.2	3.5	3.1	3.5	3.4	3.1	3.6	3.4	3.4	3.3	3.4	3.4	3.3	3.6	3.2	3.9	4.2	3.7	3.6	3.2	3.5	3.3	3.4	3.4	3.3	3.4	3.2	3.4	3.3	3.5	3.5	3.1
3.5	3.3	3.3	3.4	3.3	3.3	3.2	3.4	3.3	3.2	3.4	3.4	3.4	3.3	3.5	3.3	3.3	3.5	2.9	3.5	3.5	3.2	3.4	3.2	3.6	3.3	3.4	3.4	3.2	3.5	3.3	3.3	3.5	3.3	3.4	3.1
3.5	3.4	3.4	3.4	3.5	3.4	3.4	3.5	3.2	3.3	3.4	3.6	3.7	3.2	3.6	3.3	3.3	3.5	2.9	3.6	3.2	3.3	3.5	3.1	3.6	3.2	3.3	3.4	3.2	3.5	3.3	3.7	3.5	3.2	3.4	3.3
3.3	3.5	3.2	3.4	3.6	3.3	3.4	3.5	3.3	3.5	3.2	4.1	3.6	3.2	3.5	3.3	3.5	3.3	3.2	3.6	3.9	3.7	3.5	3.2	3.5	3.5	3.5	3.3	3.2	3.7	4.2	4.0	3.7	3.2	3.5	3.5
3.4	4.0	3.6	3.6	3.5	3.0	3.6	3.5	3.3	3.6	3.3	4.1	3.6	3.5	3.4	3.4	3.6	3.2	3.5	3.6	3.9	3.9	3.4	3.2	3.3	3.6	3.5	3.3	3.4	3.7	4.1	3.7	3.8	3.2	3.5	3.7
3.1	3.4	3.5	3.5	3.4	3.4	3.6	3.6	3.5	3.6	3.8	4.2	3.6	3.6	3.5	3.6	3.8	3.5	3.6	3.6	3.8	3.7	3.4	3.6	3.6	3.8	3.5	3.3	3.4	3.5	3.4	3.3	3.4	3.5	3.5	3.5
3.2	2.9	3.1	3.2	3.1	3.3	3.1	3.1	3.3	3.6	3.8	3.5	3.4	3.2	3.1	3.0	2.8	3.2	3.4	3.3	2.9	2.8	3.1	3.5	3.2	3.0	3.4	3.5	3.1	3.0	3.1	3.0	3.1	3.4	3.1	2.8
2.8	2.9	2.6	2.8	2.6	2.4	2.4	2.5	2.7	2.7	2.7	3.0	2.6	2.6	2.5	2.5	2.7	2.7	2.5	2.2	2.2	2.4	3.0	3.7	3.1	2.4	3.1	3.6	3.7	3.4	3.5	3.9	3.4	3.1	2.8	2.8
1.9	1.9	2.1	2.3	2.7	3.1	3.1	3.1	3.1	2.9	2.5	2.3	2.3	2.4	2.3	2.6	2.7	2.8	2.9	3.1	3.6	3.2	2.4	1.9	2.8	2.8	2.1	1.8	1.7	1.8	1.7	1.5	1.7	1.9	2.4	2.1
2.9	2.8	2.7	2.6	2.6	2.5	2.4	2.1	1.9	2.1	2.6	2.8	2.9	2.8	2.6	2.1	1.8	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.7	1.6	1.5	1.5	1.6	1.7	2.1	3.1	3.0

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

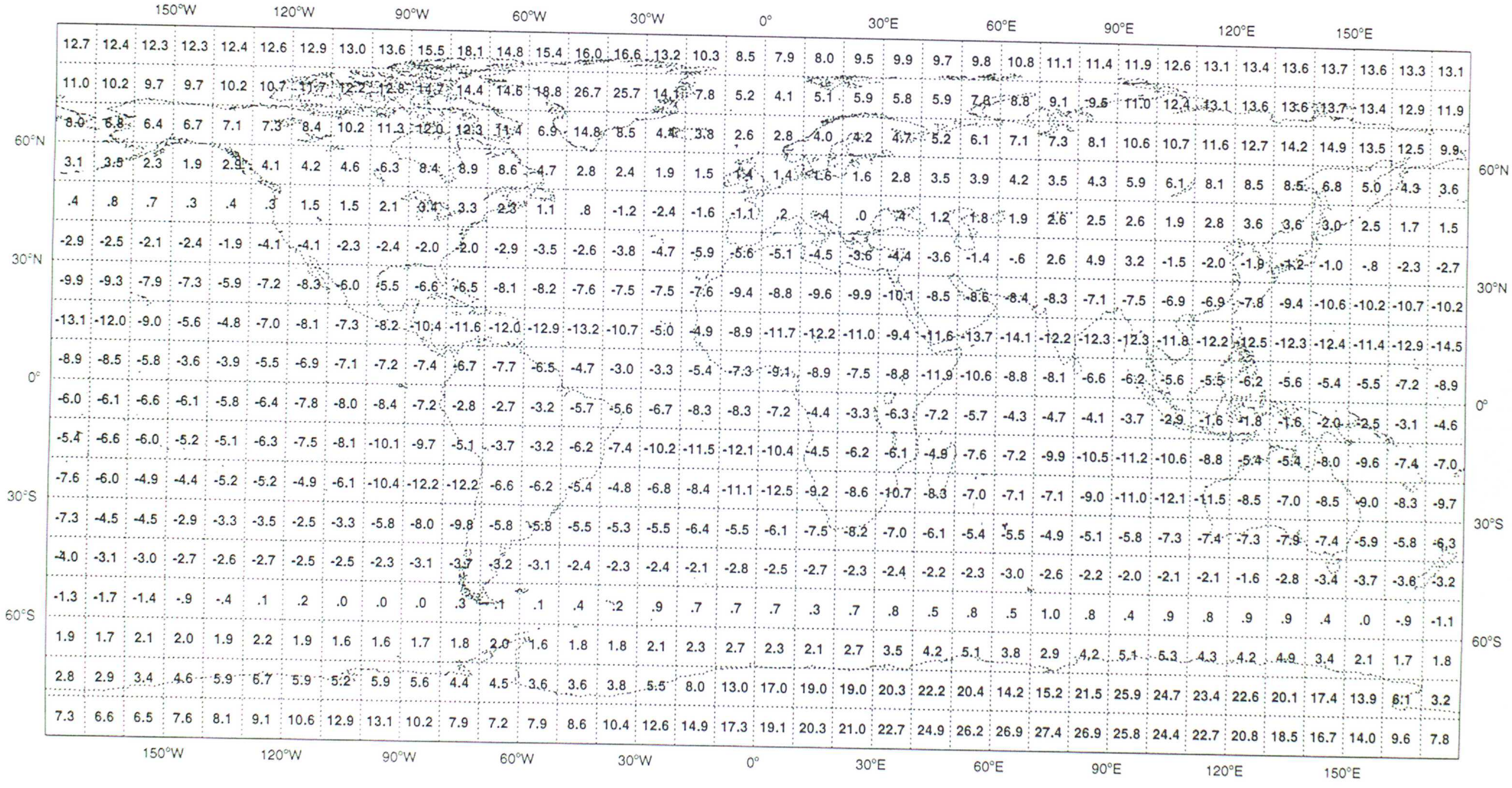
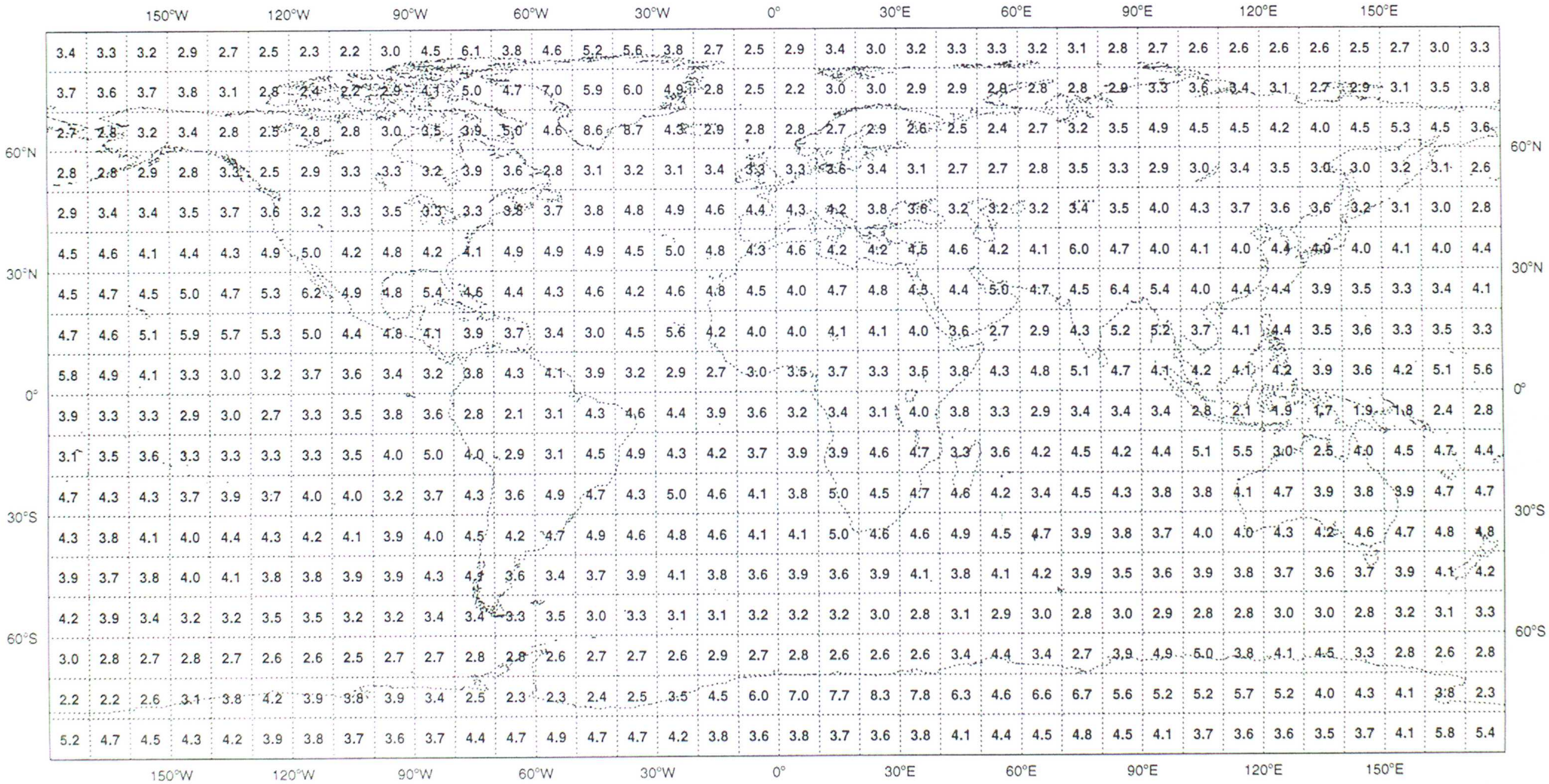
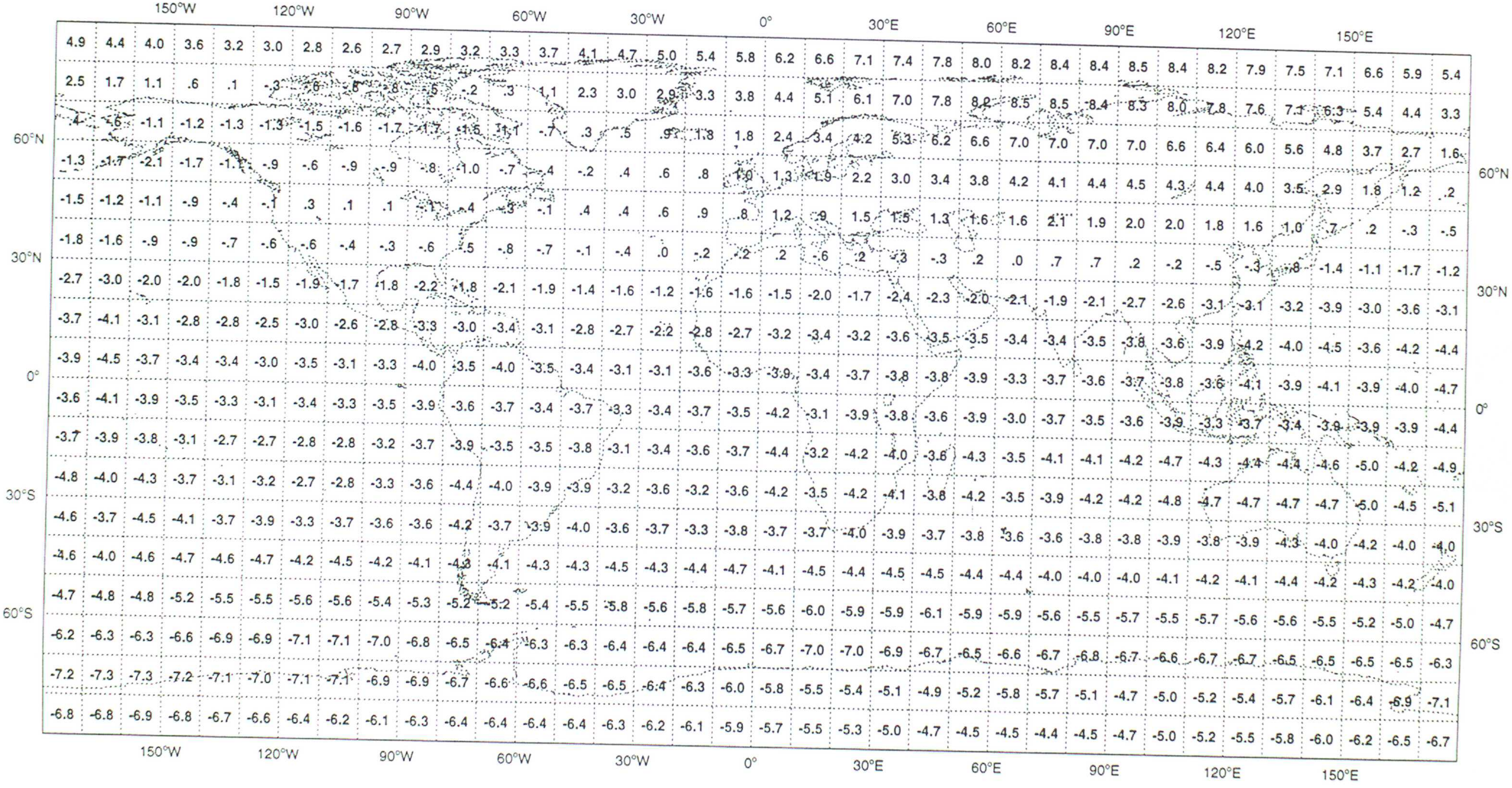

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
12.7 12.4 12.3 12.3 12.4 12.6 12.9 13.0 13.6 15.5 18.1 14.8 15.4 16.0 16.6 13.2 10.3 8.5 7.9 8.0 9.5 9.9 9.7 9.8 10.8 11.1 11.4 11.9 12.6 13.1 13.4 13.6 13.7 13.6 13.3 13.1
11.0 10.2 9.7 9.7 10.2 10.7 11.7 12.2 12.8 14.7 14.4 14.6 18.8 26.7 25.7 14.1 7.8 5.2 4.1 5.1 5.9 5.8 5.9 7.8 8.8 9.1 9.5 11.0 12.4 13.1 13.6 13.6 13.7 13.4 12.9 11.9
8.0 6.8 6.4 6.7 7.1 7.3 8.4 10.2 11.3 12.0 12.3 11.4 6.9 14.8 8.5 4.4 3.8 2.6 2.8 4.0 4.2 4.7 5.2 6.1 7.1 7.3 8.1 10.6 10.7 11.6 12.7 14.2 14.9 13.5 12.5 9.9
3.1 3.8 2.3 1.9 2.9 4.1 4.2 4.6 6.3 8.4 8.9 8.6 4.7 2.8 2.4 1.9 1.5 1.4 1.4 1.6 1.6 2.8 3.5 3.9 4.2 3.5 4.3 5.9 6.1 8.1 8.5 8.5 6.8 5.0 4.3 3.6
.4 .8 .7 .3 .4 .3 1.5 1.5 2.1 3.4 3.3 2.3 1.1 .8 -1.2 -2.4 -1.6 -1.1 .2 .4 .0 .4 1.2 1.8 1.9 2.6 2.5 2.6 1.9 2.8 3.6 3.6 3.0 2.5 1.7 1.5
-2.9 -2.5 -2.1 -2.4 -1.9 -4.1 -4.1 -2.3 -2.4 -2.0 -2.0 -2.9 -3.5 -2.6 -3.8 -4.7 -5.9 -5.6 -5.1 -4.5 -3.6 -4.4 -3.6 -1.4 -.6 2.6 4.9 3.2 -1.5 -2.0 -1.9 -1.2 -1.0 -.8 -2.3 -2.7
-9.9 -9.3 -7.9 -7.3 -5.9 -7.2 -8.3 -6.0 -5.5 -6.6 -6.5 -8.1 -8.2 -7.6 -7.5 -7.5 -7.6 -9.4 -8.8 -9.6 -9.9 -10.1 -8.5 -8.6 -8.4 -8.3 -7.1 -7.5 -6.9 -6.9 -7.8 -9.4 -10.6 -10.2 -10.7 -10.2
-13.1 -12.0 -9.0 -5.6 -4.8 -7.0 -8.1 -7.3 -8.2 -10.4 -11.6 -12.0 -12.9 -13.2 -10.7 -5.0 -4.9 -8.9 -11.7 -12.2 -11.0 -9.4 -11.6 -13.7 -14.1 -12.2 -12.3 -12.3 -11.8 -12.2 -12.5 -12.3 -12.4 -11.4 -12.9 -14.5
-8.9 -8.5 -5.8 -3.6 -3.9 -5.5 -6.9 -7.1 -7.2 -7.4 -6.7 -7.7 -6.5 -4.7 -3.0 -3.3 -5.4 -7.3 -9.1 -8.9 -7.5 -8.8 -11.9 -10.6 -8.8 -8.1 -6.6 -6.2 -5.6 -5.5 -6.2 -5.6 -5.4 -5.5 -7.2 -8.9
-6.0 -6.1 -6.6 -6.1 -5.8 -6.4 -7.8 -8.0 -8.4 -7.2 -2.8 -2.7 -3.2 -5.7 -5.6 -6.7 -8.3 -8.3 -7.2 -4.4 -3.3 -6.3 -7.2 -5.7 -4.3 -4.7 -4.1 -3.7 -2.9 -1.6 -1.8 -1.6 -2.0 -2.5 -3.1 -4.6
-5.4 -6.6 -6.0 -5.2 -5.1 -6.3 -7.5 -8.1 -10.1 -9.7 -5.1 -3.7 -3.2 -6.2 -7.4 -10.2 -11.5 -12.1 -10.4 -4.5 -6.2 -6.1 -4.9 -7.6 -7.2 -9.9 -10.5 -11.2 -10.6 -8.8 -5.4 -5.4 -8.0 -9.6 -7.4 -7.0
-7.6 -6.0 -4.9 -4.4 -5.2 -5.2 -4.9 -6.1 -10.4 -12.2 -12.2 -6.6 -6.2 -5.4 -4.8 -6.8 -8.4 -11.1 -12.5 -9.2 -8.6 -10.7 -8.3 -7.0 -7.1 -7.1 -9.0 -11.0 -12.1 -11.5 -8.5 -7.0 -8.5 -9.0 -8.3 -9.7
-7.3 -4.5 -4.5 -2.9 -3.3 -3.5 -2.5 -3.3 -5.8 -8.0 -9.8 -5.8 -5.8 -5.5 -5.3 -5.5 -6.4 -5.5 -6.1 -7.5 -8.2 -7.0 -6.1 -5.4 -5.5 -4.9 -5.1 -5.8 -7.3 -7.4 -7.3 -7.9 -7.4 -5.9 -5.8 -6.3
-4.0 -3.1 -3.0 -2.7 -2.6 -2.7 -2.5 -2.5 -2.3 -3.1 -3.7 -3.2 -3.1 -2.4 -2.3 -2.4 -2.1 -2.8 -2.5 -2.7 -2.3 -2.4 -2.2 -2.3 -3.0 -2.6 -2.2 -2.0 -2.1 -2.1 -1.6 -2.8 -3.4 -3.7 -3.6 -3.2
-1.3 -1.7 -1.4 -.9 -.4 .1 .2 .0 .0 .0 .3 .1 .1 .4 .2 .9 .7 .7 .7 .3 .7 .8 .5 .8 .5 1.0 .8 .4 .9 .8 .9 .9 .4 .0 -.9 -1.1
1.9 1.7 2.1 2.0 1.9 2.2 1.9 1.6 1.6 1.7 1.8 2.0 1.6 1.8 1.8 2.1 2.3 2.7 2.3 2.1 2.7 3.5 4.2 5.1 3.8 2.9 4.2 5.1 5.3 4.3 4.2 4.9 3.4 2.1 1.7 1.8
2.8 2.9 3.4 4.6 5.9 6.7 5.9 5.2 5.9 5.6 4.4 4.5 3.6 3.6 3.8 5.5 8.0 13.0 17.0 19.0 19.0 20.3 22.2 20.4 14.2 15.2 21.5 25.9 24.7 23.4 22.6 20.1 17.4 13.9 6.1 3.2
7.3 6.6 6.5 7.6 8.1 9.1 10.6 12.9 13.1 10.2 7.9 7.2 7.9 8.6 10.4 12.6 14.9 17.3 19.1 20.3 21.0 22.7 24.9 26.2 26.9 27.4 26.9 25.8 24.4 22.7 20.8 18.5 16.7 14.0 9.6 7.8

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



3.4	3.3	3.2	2.9	2.7	2.5	2.3	2.2	3.0	4.5	6.1	3.8	4.6	5.2	5.6	3.8	2.7	2.5	2.9	3.4	3.0	3.2	3.3	3.3	3.2	3.1	2.8	2.7	2.6	2.6	2.6	2.6	2.5	2.7	3.0	3.3
3.7	3.6	3.7	3.8	3.1	2.8	2.4	2.2	2.9	4.1	5.0	4.7	7.0	5.9	6.0	4.9	2.8	2.5	2.2	3.0	3.0	2.9	2.9	2.8	2.8	2.8	2.9	3.3	3.6	3.4	3.1	2.7	2.9	3.1	3.5	3.8
2.7	2.8	3.2	3.4	2.8	2.5	2.8	2.8	3.0	3.5	3.9	5.0	4.6	8.6	8.7	4.3	2.9	2.8	2.8	2.7	2.9	2.6	2.5	2.4	2.7	3.2	3.5	4.9	4.5	4.5	4.2	4.0	4.5	5.3	4.5	3.6
2.8	2.8	2.9	2.8	3.3	2.5	2.9	3.3	3.3	3.2	3.9	3.6	2.8	3.1	3.2	3.1	3.4	3.3	3.3	3.6	3.4	3.1	2.7	2.7	2.8	3.5	3.3	2.9	3.0	3.4	3.5	3.0	3.0	3.2	3.1	2.6
2.9	3.4	3.4	3.5	3.7	3.6	3.2	3.3	3.5	3.3	3.3	3.8	3.7	3.8	4.8	4.9	4.6	4.4	4.3	4.2	3.8	3.6	3.2	3.2	3.2	3.4	3.5	4.0	4.3	3.7	3.6	3.6	3.2	3.1	3.0	2.8
4.5	4.6	4.1	4.4	4.3	4.9	5.0	4.2	4.8	4.2	4.1	4.9	4.9	4.9	4.5	5.0	4.8	4.3	4.6	4.2	4.2	4.5	4.6	4.2	4.1	6.0	4.7	4.0	4.1	4.0	4.4	4.0	4.0	4.1	4.0	4.4
4.5	4.7	4.5	5.0	4.7	5.3	6.2	4.9	4.8	5.4	4.6	4.4	4.3	4.6	4.2	4.6	4.8	4.5	4.0	4.7	4.8	4.5	4.4	5.0	4.7	4.5	6.4	5.4	4.0	4.4	4.4	3.9	3.5	3.3	3.4	4.1
4.7	4.6	5.1	5.9	5.7	5.3	5.0	4.4	4.8	4.1	3.9	3.7	3.4	3.0	4.5	5.6	4.2	4.0	4.0	4.1	4.1	4.0	3.6	2.7	2.9	4.3	5.2	5.2	3.7	4.1	4.4	3.5	3.6	3.3	3.5	3.3
5.8	4.9	4.1	3.3	3.0	3.2	3.7	3.6	3.4	3.2	3.8	4.3	4.1	3.9	3.2	2.9	2.7	3.0	3.5	3.7	3.3	3.5	3.8	4.3	4.8	5.1	4.7	4.1	4.2	4.1	4.2	3.9	3.6	4.2	5.1	5.6
3.9	3.3	3.3	2.9	3.0	2.7	3.3	3.5	3.8	3.6	2.8	2.1	3.1	4.3	4.6	4.4	3.9	3.6	3.2	3.4	3.1	4.0	3.8	3.3	2.9	3.4	3.4	3.4	2.8	2.1	1.9	1.7	1.9	1.8	2.4	2.8
3.1	3.5	3.6	3.3	3.3	3.3	3.3	3.5	4.0	5.0	4.0	2.9	3.1	4.5	4.9	4.3	4.2	3.7	3.9	3.9	4.6	4.7	3.3	3.6	4.2	4.5	4.2	4.4	5.1	5.5	3.0	2.5	4.0	4.5	4.7	4.4
4.7	4.3	4.3	3.7	3.9	3.7	4.0	4.0	3.2	3.7	4.3	3.6	4.9	4.7	4.3	5.0	4.6	4.1	3.8	5.0	4.5	4.7	4.6	4.2	3.4	4.5	4.3	3.8	3.8	4.1	4.7	3.9	3.8	3.9	4.7	4.7
4.3	3.8	4.1	4.0	4.4	4.3	4.2	4.1	3.9	4.0	4.5	4.2	4.7	4.9	4.6	4.8	4.6	4.1	4.1	5.0	4.6	4.6	4.9	4.5	4.7	3.9	3.8	3.7	4.0	4.0	4.3	4.2	4.6	4.7	4.8	4.8
3.9	3.7	3.8	4.0	4.1	3.8	3.8	3.9	3.9	4.3	4.1	3.6	3.4	3.7	3.9	4.1	3.8	3.6	3.9	3.6	3.9	4.1	3.8	4.1	4.2	3.9	3.5	3.6	3.9	3.8	3.7	3.6	3.7	3.9	4.1	4.2
4.2	3.9	3.4	3.2	3.2	3.5	3.5	3.2	3.2	3.4	3.4	3.3	3.5	3.0	3.3	3.1	3.1	3.2	3.2	3.2	3.0	2.8	3.1	2.9	3.0	2.8	3.0	2.9	2.8	2.8	3.0	3.0	2.8	3.2	3.1	3.3
3.0	2.8	2.7	2.8	2.7	2.6	2.6	2.5	2.7	2.7	2.8	2.8	2.6	2.7	2.7	2.6	2.9	2.7	2.8	2.6	2.6	2.6	3.4	4.4	3.4	2.7	3.9	4.9	5.0	3.8	4.1	4.5	3.3	2.8	2.6	2.8
2.2	2.2	2.6	3.1	3.8	4.2	3.9	3.8	3.9	3.4	2.5	2.3	2.3	2.4	2.5	3.5	4.5	6.0	7.0	7.7	8.3	7.8	6.3	4.6	6.6	6.7	5.6	5.2	5.2	5.7	5.2	4.0	4.3	4.1	3.8	2.3
5.2	4.7	4.5	4.3	4.2	3.9	3.8	3.7	3.6	3.7	4.4	4.7	4.9	4.7	4.7	4.2	3.8	3.6	3.8	3.7	3.6	3.8	4.1	4.4	4.5	4.8	4.5	4.1	3.7	3.6	3.6	3.5	3.7	4.1	5.8	5.4

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

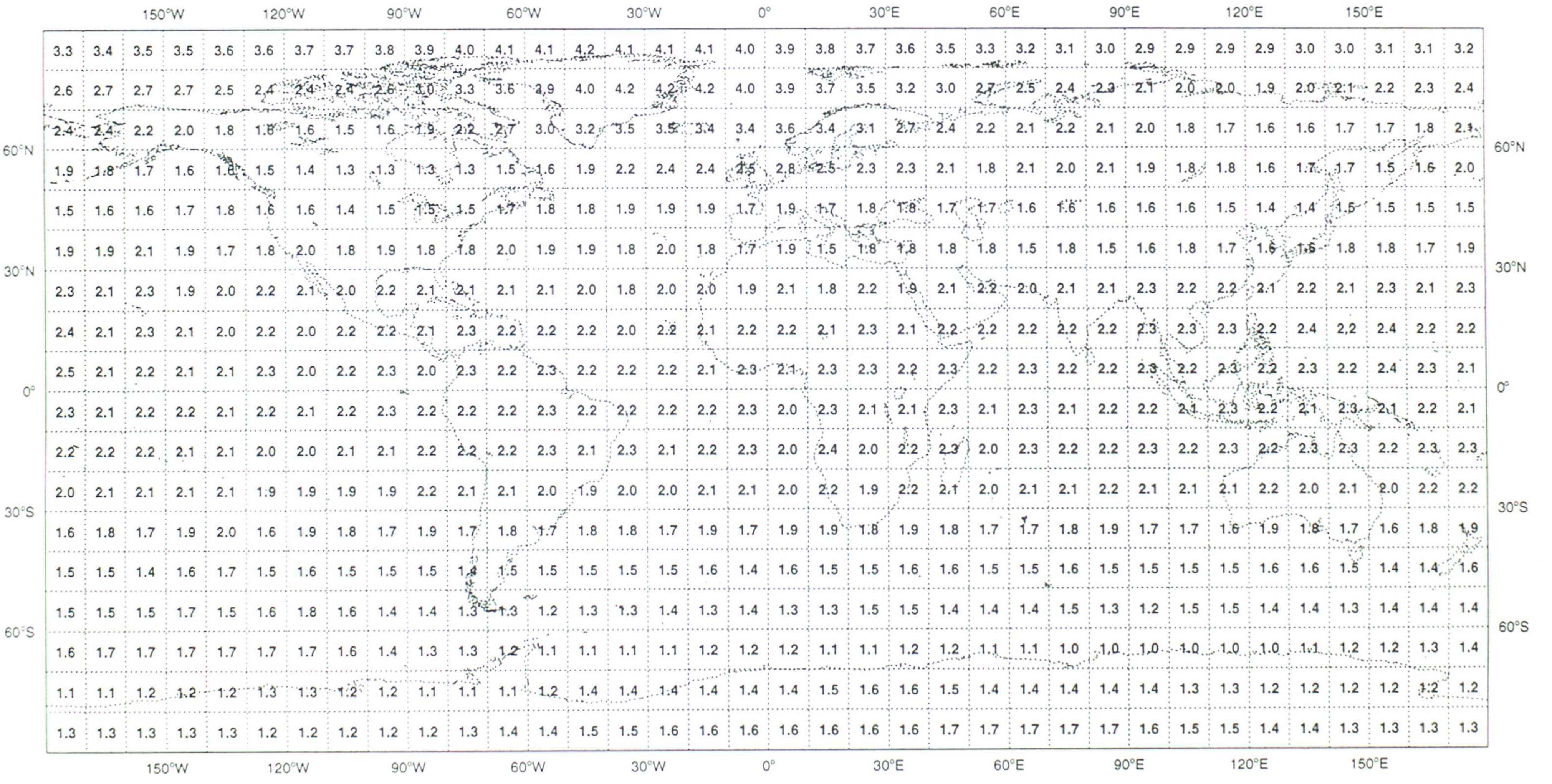


4.9	4.4	4.0	3.6	3.2	3.0	2.8	2.6	2.7	2.9	3.2	3.3	3.7	4.1	4.7	5.0	5.4	5.8	6.2	6.6	7.1	7.4	7.8	8.0	8.2	8.4	8.4	8.5	8.4	8.2	7.9	7.5	7.1	6.6	5.9	5.4
2.5	1.7	1.1	.6	.1	-.3	-.6	-.8	-.8	-.5	-.2	.3	1.1	2.3	3.0	2.9	3.3	3.8	4.4	5.1	6.1	7.0	7.8	8.2	8.5	8.5	8.4	8.3	8.0	7.8	7.6	7.1	6.3	5.4	4.4	3.3
-.4	-.6	-1.1	-1.2	-1.3	-1.3	-1.5	-1.6	-1.7	-1.7	-1.5	-1.1	-.7	.3	.5	.9	1.8	1.8	2.4	3.4	4.2	5.3	6.2	6.6	7.0	7.0	7.0	7.0	6.6	6.4	6.0	5.6	4.8	3.7	2.7	1.6
-1.3	-1.7	-2.1	-1.7	-1.1	-.9	-.6	-.9	-.9	-.8	-1.0	-.7	-.4	-.2	.4	.6	.8	1.0	1.3	1.9	2.2	3.0	3.4	3.8	4.2	4.1	4.4	4.5	4.3	4.4	4.0	3.5	2.9	1.8	1.2	.2
-1.5	-1.2	-1.1	-.9	-.4	-.1	.3	.1	.1	-.1	-.4	-.3	-.1	.4	.4	.6	.9	.8	1.2	.9	1.5	1.5	1.3	1.6	1.6	2.1	1.9	2.0	2.0	1.8	1.6	1.0	.7	.2	-.3	-.5
-1.8	-1.6	-.9	-.9	-.7	-.6	-.6	-.4	-.3	-.6	.5	-.8	-.7	-.1	-.4	.0	-.2	-.2	.2	-.6	.2	-.3	-.3	.2	.0	.7	.7	.2	-.2	-.5	-.3	-.8	-1.4	-1.1	-1.7	-1.2
-2.7	-3.0	-2.0	-2.0	-1.8	-1.5	-1.9	-1.7	-1.8	-2.2	-1.8	-2.1	-1.9	-1.4	-1.6	-1.2	-1.6	-1.6	-1.5	-2.0	-1.7	-2.4	-2.3	-2.0	-2.1	-1.9	-2.1	-2.7	-2.6	-3.1	-3.1	-3.2	-3.9	-3.0	-3.6	-3.1
-3.7	-4.1	-3.1	-2.8	-2.8	-2.5	-3.0	-2.6	-2.8	-3.3	-3.0	-3.4	-3.1	-2.8	-2.7	-2.2	-2.8	-2.7	-3.2	-3.4	-3.2	-3.6	-3.5	-3.5	-3.4	-3.4	-3.5	-3.8	-3.6	-3.9	-4.2	-4.0	-4.5	-3.6	-4.2	-4.4
-3.9	-4.5	-3.7	-3.4	-3.4	-3.0	-3.5	-3.1	-3.3	-4.0	-3.5	-4.0	-3.5	-3.4	-3.1	-3.1	-3.6	-3.3	-3.9	-3.4	-3.7	-3.8	-3.8	-3.9	-3.3	-3.7	-3.6	-3.7	-3.8	-3.6	-4.1	-3.9	-4.1	-3.9	-4.0	-4.7
-3.6	-4.1	-3.9	-3.5	-3.3	-3.1	-3.4	-3.3	-3.5	-3.9	-3.6	-3.7	-3.4	-3.7	-3.3	-3.4	-3.7	-3.5	-4.2	-3.1	-3.9	-3.8	-3.6	-3.9	-3.0	-3.7	-3.5	-3.6	-3.9	-3.3	-3.7	-3.4	-3.9	-3.9	-3.9	-4.4
-3.7	-3.9	-3.8	-3.1	-2.7	-2.7	-2.8	-2.8	-3.2	-3.7	-3.9	-3.5	-3.5	-3.8	-3.1	-3.4	-3.6	-3.7	-4.4	-3.2	-4.2	-4.0	-3.6	-4.3	-3.5	-4.1	-4.1	-4.2	-4.7	-4.3	-4.4	-4.4	-4.6	-5.0	-4.2	-4.9
-4.8	-4.0	-4.3	-3.7	-3.1	-3.2	-2.7	-2.8	-3.3	-3.6	-4.4	-4.0	-3.9	-3.9	-3.2	-3.6	-3.2	-3.6	-4.2	-3.5	-4.2	-4.1	-3.8	-4.2	-3.5	-3.9	-4.2	-4.2	-4.8	-4.7	-4.7	-4.7	-4.7	-5.0	-4.5	-5.1
-4.6	-3.7	-4.5	-4.1	-3.7	-3.9	-3.3	-3.7	-3.6	-3.6	-4.2	-3.7	-3.9	-4.0	-3.6	-3.7	-3.3	-3.8	-3.7	-3.7	-4.0	-3.9	-3.7	-3.8	-3.6	-3.6	-3.8	-3.8	-3.9	-3.8	-3.9	-4.3	-4.0	-4.2	-4.0	-4.0
-4.6	-4.0	-4.6	-4.7	-4.6	-4.7	-4.2	-4.5	-4.2	-4.1	-4.3	-4.1	-4.3	-4.3	-4.5	-4.3	-4.4	-4.7	-4.1	-4.5	-4.4	-4.5	-4.5	-4.4	-4.4	-4.0	-4.0	-4.0	-4.1	-4.2	-4.1	-4.4	-4.2	-4.3	-4.2	-4.0
-4.7	-4.8	-4.8	-5.2	-5.5	-5.5	-5.6	-5.6	-5.4	-5.3	-5.2	-5.2	-5.4	-5.5	-5.8	-5.6	-5.8	-5.7	-5.6	-6.0	-5.9	-5.9	-6.1	-5.9	-5.9	-5.6	-5.5	-5.7	-5.5	-5.7	-5.6	-5.6	-5.5	-5.2	-5.0	-4.7
-6.2	-6.3	-6.3	-6.6	-6.9	-6.9	-7.1	-7.1	-7.0	-6.8	-6.5	-6.4	-6.3	-6.3	-6.4	-6.4	-6.4	-6.5	-6.7	-7.0	-7.0	-6.9	-6.7	-6.5	-6.6	-6.7	-6.8	-6.7	-6.6	-6.7	-6.7	-6.5	-6.5	-6.5	-6.5	-6.3
-7.2	-7.3	-7.3	-7.2	-7.1	-7.0	-7.1	-7.1	-6.9	-6.9	-6.7	-6.6	-6.6	-6.5	-6.5	-6.4	-6.3	-6.0	-5.8	-5.5	-5.4	-5.1	-4.9	-5.2	-5.8	-5.7	-5.1	-4.7	-5.0	-5.2	-5.4	-5.7	-6.1	-6.4	-6.9	-7.1
-6.8	-6.8	-6.9	-6.8	-6.7	-6.6	-6.4	-6.2	-6.1	-6.3	-6.4	-6.4	-6.4	-6.4	-6.3	-6.2	-6.1	-5.9	-5.7	-5.5	-5.3	-5.0	-4.7	-4.5	-4.5	-4.4	-4.5	-4.7	-5.0	-5.2	-5.5	-5.8	-6.0	-6.2	-6.5	-6.7

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002

Channel: HIRS4 (400 hPa)

NOAA15, using all observations



3.3	3.4	3.5	3.5	3.6	3.6	3.7	3.7	3.8	3.9	4.0	4.1	4.1	4.2	4.1	4.1	4.1	4.0	3.9	3.8	3.7	3.6	3.5	3.3	3.2	3.1	3.0	2.9	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.2
2.6	2.7	2.7	2.7	2.5	2.4	2.4	2.4	2.6	3.0	3.3	3.6	3.9	4.0	4.2	4.2	4.2	4.0	3.9	3.7	3.5	3.2	3.0	2.7	2.5	2.4	2.3	2.1	2.0	2.0	1.9	2.0	2.1	2.2	2.3	2.4
2.4	2.4	2.2	2.0	1.8	1.8	1.6	1.5	1.6	1.9	2.2	2.7	3.0	3.2	3.5	3.5	3.4	3.4	3.6	3.4	3.1	2.7	2.4	2.2	2.1	2.2	2.1	2.0	1.8	1.7	1.6	1.6	1.7	1.7	1.8	2.1
1.9	1.8	1.7	1.6	1.6	1.5	1.4	1.3	1.3	1.3	1.3	1.5	1.6	1.9	2.2	2.4	2.4	2.5	2.8	2.5	2.3	2.3	2.1	1.8	2.1	2.0	2.1	1.9	1.8	1.8	1.6	1.7	1.7	1.5	1.6	2.0
1.5	1.6	1.6	1.7	1.8	1.6	1.6	1.4	1.5	1.5	1.5	1.7	1.8	1.8	1.9	1.9	1.9	1.7	1.9	1.7	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.6	1.6	1.5	1.4	1.4	1.5	1.5	1.5	1.5
1.9	1.9	2.1	1.9	1.7	1.8	2.0	1.8	1.9	1.8	1.8	2.0	1.9	1.9	1.8	2.0	1.8	1.7	1.9	1.5	1.8	1.8	1.8	1.8	1.5	1.8	1.5	1.6	1.8	1.7	1.6	1.6	1.8	1.8	1.7	1.9
2.3	2.1	2.3	1.9	2.0	2.2	2.1	2.0	2.2	2.1	2.1	2.1	2.1	2.0	1.8	2.0	2.0	1.9	2.1	1.8	2.2	1.9	2.1	2.2	2.0	2.1	2.1	2.3	2.2	2.2	2.1	2.2	2.1	2.3	2.1	2.3
2.4	2.1	2.3	2.1	2.0	2.2	2.0	2.2	2.2	2.1	2.3	2.2	2.2	2.2	2.0	2.2	2.1	2.2	2.2	2.1	2.3	2.1	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.2	2.4	2.2	2.4	2.2	2.2
2.5	2.1	2.2	2.1	2.1	2.3	2.0	2.2	2.3	2.0	2.3	2.2	2.3	2.2	2.2	2.2	2.1	2.3	2.1	2.3	2.3	2.2	2.3	2.2	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.2	2.4	2.3	2.1
2.3	2.1	2.2	2.2	2.1	2.2	2.1	2.2	2.3	2.2	2.2	2.2	2.3	2.2	2.2	2.2	2.2	2.3	2.0	2.3	2.1	2.1	2.3	2.1	2.3	2.1	2.2	2.2	2.1	2.3	2.2	2.1	2.3	2.1	2.2	2.1
2.2	2.2	2.2	2.1	2.1	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.3	2.1	2.3	2.1	2.2	2.3	2.0	2.4	2.0	2.2	2.3	2.0	2.3	2.2	2.2	2.3	2.2	2.3	2.2	2.3	2.3	2.2	2.3	2.3
2.0	2.1	2.1	2.1	2.1	1.9	1.9	1.9	1.9	2.2	2.1	2.1	2.0	1.9	2.0	2.0	2.1	2.1	2.0	2.2	1.9	2.2	2.1	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.2	2.0	2.1	2.0	2.2	2.2
1.6	1.8	1.7	1.9	2.0	1.6	1.9	1.8	1.7	1.9	1.7	1.8	1.7	1.8	1.8	1.7	1.9	1.7	1.9	1.9	1.8	1.9	1.8	1.7	1.7	1.8	1.9	1.7	1.7	1.6	1.9	1.8	1.7	1.6	1.8	1.9
1.5	1.5	1.4	1.6	1.7	1.5	1.6	1.5	1.5	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.6	1.4	1.6	1.5	1.5	1.6	1.6	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.5	1.4	1.4	1.6
1.5	1.5	1.5	1.7	1.5	1.6	1.8	1.6	1.4	1.4	1.3	1.3	1.2	1.3	1.3	1.4	1.3	1.4	1.3	1.3	1.5	1.5	1.4	1.4	1.4	1.5	1.3	1.2	1.5	1.5	1.4	1.4	1.3	1.4	1.4	1.4
1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.6	1.4	1.3	1.3	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.2	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.4
1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2
1.3	1.3	1.3	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.3

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

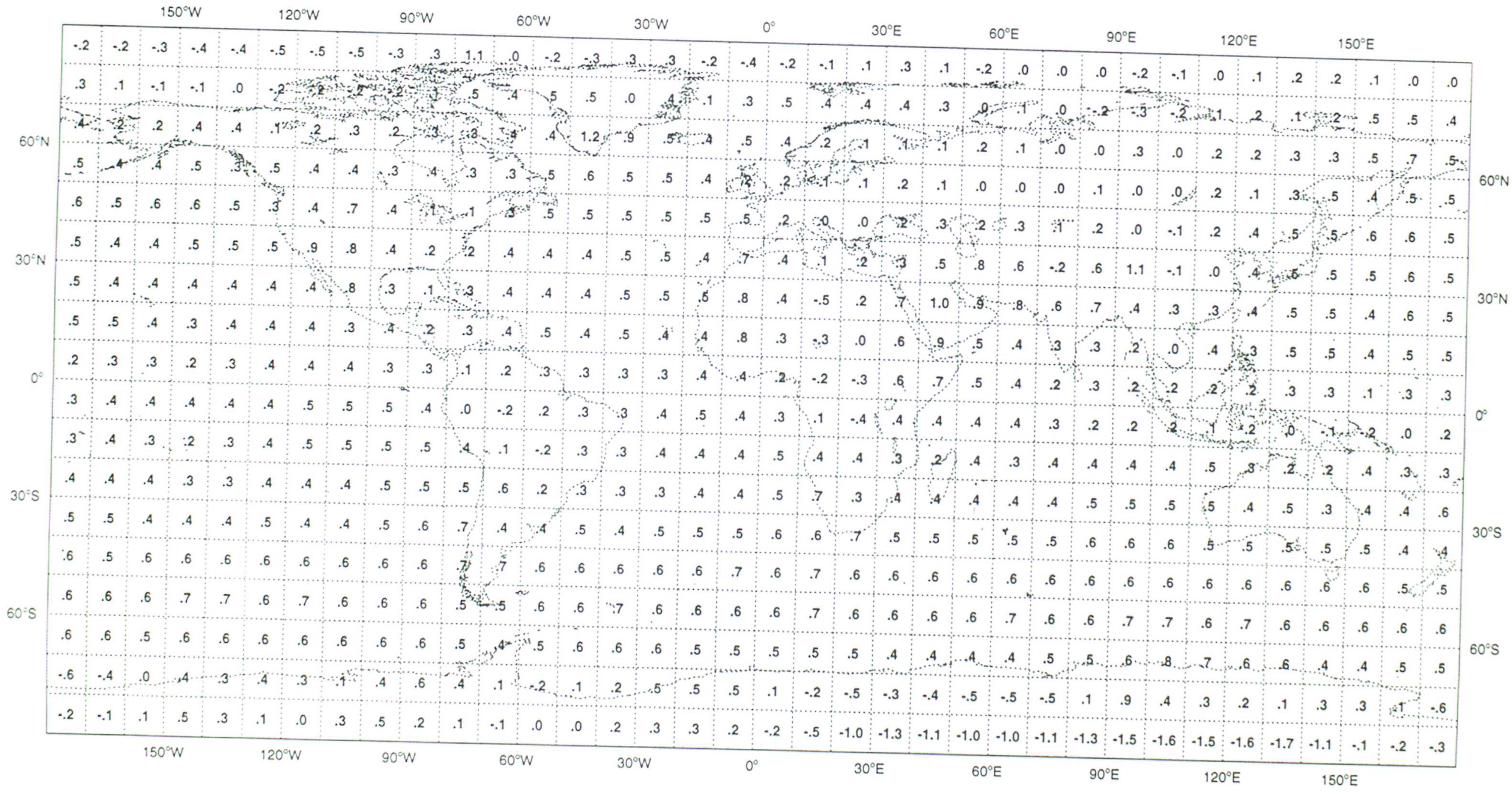
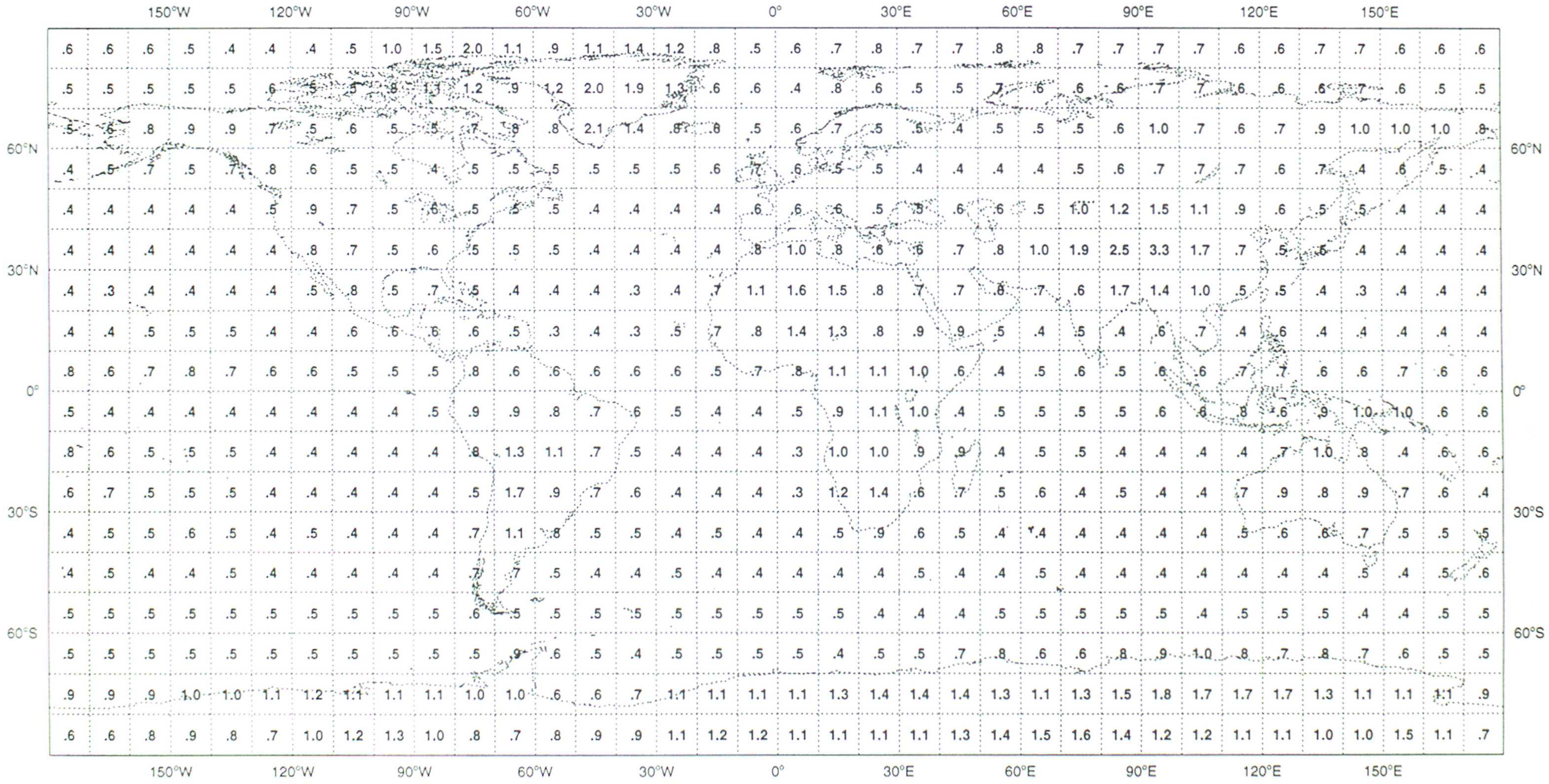
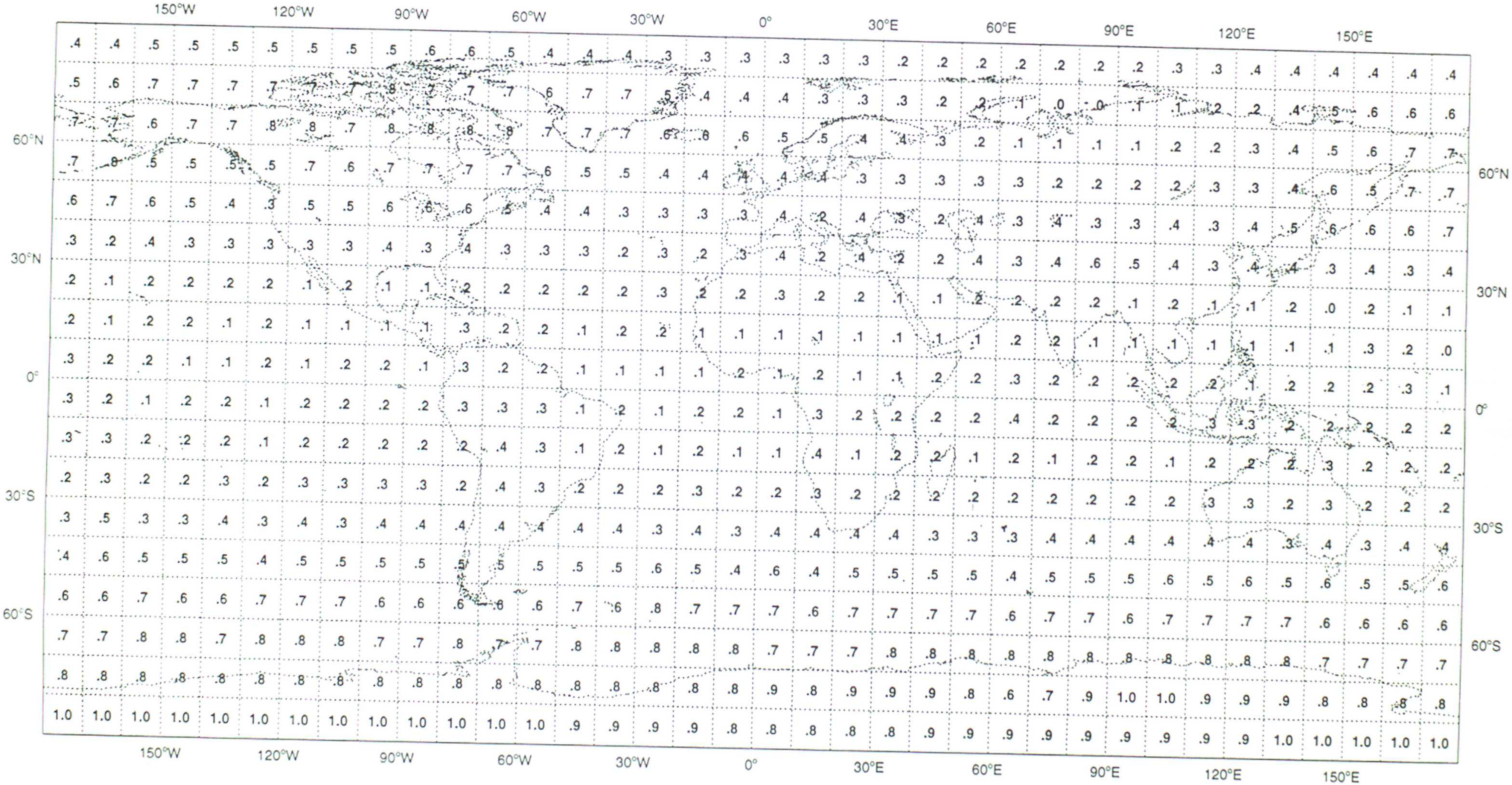

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.2 -.2 -.3 -.4 -.4 -.5 -.5 -.5 -.3 .3 1.1 .0 -.2 -.3 .3 .3 -.2 -.4 -.2 -.1 .1 .3 .1 -.2 .0 .0 .0 -.2 -.1 .0 .1 .2 .2 .1 .0 .0
.3 .1 -.1 -.1 .0 -.2 .2 -.2 .2 .1 .5 .4 .5 .5 .0 .4 .1 .3 .5 .4 .4 .4 .3 .0 .1 .0 -.2 -.3 -.2 .1 .2 .1 .2 .5 .5 .4
.4 .2 .2 .4 .4 .1 .2 .3 .2 .3 .3 .4 .4 1.2 .9 .5 .4 .5 .4 .2 .1 .1 .1 .2 .1 .0 .0 .3 .0 .2 .2 .3 .3 .5 .7 .5
.5 .4 .4 .5 .3 .5 .4 .4 .3 .4 .3 .3 .5 .6 .5 .5 .4 .2 .2 .1 .1 .2 .1 .0 .0 .0 .1 .0 .0 .2 .1 .3 .5 .4 .5 .5
.6 .5 .6 .6 .5 .3 .4 .7 .4 .1 .1 .3 .5 .5 .5 .5 .5 .5 .2 .0 .0 .2 .3 .2 .3 .1 .2 .0 -.1 .2 .4 .5 .5 .6 .6 .5
.5 .4 .4 .5 .5 .5 .9 .8 .4 .2 .2 .4 .4 .4 .5 .5 .4 .7 .4 .1 .2 .3 .5 .8 .6 -.2 .6 1.1 -.1 .0 .4 .5 .5 .5 .6 .5
.5 .4 .4 .4 .4 .4 .4 .8 .3 .1 .3 .4 .4 .4 .5 .5 .5 .8 .4 -.5 .2 .7 1.0 .9 .8 .6 .7 .4 .3 .3 .4 .5 .5 .4 .6 .5
.5 .5 .4 .3 .4 .4 .4 .3 .4 .2 .3 .4 .5 .4 .5 .4 .4 .8 .3 -.3 .0 .6 .9 .5 .4 .3 .3 .2 .0 .4 .3 .5 .5 .4 .5 .5
.2 .3 .3 .2 .3 .4 .4 .4 .3 .3 .1 .2 .3 .3 .3 .3 .4 .4 .2 -.2 -.3 .6 .7 .5 .4 .2 .3 .2 .2 .2 .2 .3 .3 .1 .3 .3
.3 .4 .4 .4 .4 .4 .5 .5 .5 .4 .0 -.2 .2 .3 .3 .4 .5 .4 .3 .1 -.4 .4 .4 .4 .4 .3 .2 .2 .2 .1 .2 .0 -.1 -.2 .0 .2
.3 .4 .3 .2 .3 .4 .5 .5 .5 .5 .4 .1 -.2 .3 .3 .4 .4 .4 .5 .4 .4 .3 .2 .4 .3 .4 .4 .4 .4 .5 .3 .2 .2 .4 .3 .3
.4 .4 .4 .3 .3 .4 .4 .4 .5 .5 .5 .6 .2 .3 .3 .3 .4 .4 .5 .7 .3 .4 .4 .4 .4 .4 .5 .5 .5 .5 .4 .5 .3 .4 .4 .6
.5 .5 .4 .4 .4 .5 .4 .4 .5 .6 .7 .4 .4 .5 .4 .5 .5 .5 .6 .6 .7 .5 .5 .5 .5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .4 .4
.6 .5 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .7 .6 .7 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5
.6 .6 .6 .7 .7 .6 .7 .6 .6 .6 .5 .5 .6 .6 .7 .6 .6 .6 .6 .7 .6 .6 .6 .6 .7 .6 .6 .7 .7 .6 .7 .6 .6 .6 .6 .6
.6 .6 .5 .6 .6 .6 .6 .6 .6 .6 .5 .4 .5 .6 .6 .6 .5 .5 .5 .5 .5 .4 .4 .4 .4 .5 .5 .6 .8 .7 .6 .6 .4 .4 .5 .5
-.6 -.4 .0 .4 .3 .4 .3 .1 .4 .6 .4 .1 -.2 .1 .2 .5 .5 .5 .1 -.2 -.5 -.3 -.4 -.5 -.5 -.5 .1 .9 .4 .3 .2 .1 .3 .3 .1 -.6
-.2 -.1 .1 .5 .3 .1 .0 .3 .5 .2 .1 -.1 .0 .0 .2 .3 .3 .2 -.2 -.5 -1.0 -1.3 -1.1 -1.0 -1.0 -1.1 -1.3 -1.5 -1.6 -1.5 -1.6 -1.7 -1.1 -.1 -.2 -.3

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.6	.6	.6	.5	.4	.4	.4	.5	1.0	1.5	2.0	1.1	.9	1.1	1.4	1.2	.8	.5	.6	.7	.8	.7	.7	.8	.8	.7	.7	.7	.7	.6	.6	.7	.7	.6	.6	.6
.5	.5	.5	.5	.5	.6	.5	.5	.8	1.1	1.2	.9	1.2	2.0	1.9	1.3	.6	.6	.4	.8	.6	.5	.5	.7	.6	.6	.6	.7	.7	.6	.6	.6	.7	.6	.5	.5
.5	.6	.8	.9	.9	.7	.5	.6	.5	.5	.7	.8	.8	2.1	1.4	.8	.8	.5	.6	.7	.5	.5	.4	.5	.5	.5	.6	1.0	.7	.6	.7	.9	1.0	1.0	1.0	.8
.4	.5	.7	.5	.7	.8	.6	.5	.5	.4	.5	.5	.5	.5	.5	.5	.6	.7	.6	.5	.5	.4	.4	.4	.4	.5	.6	.7	.7	.7	.6	.7	.4	.6	.5	.4
.4	.4	.4	.4	.4	.5	.9	.7	.5	.6	.5	.5	.5	.4	.4	.4	.4	.6	.6	.6	.5	.5	.6	.6	.5	1.0	1.2	1.5	1.1	.9	.6	.5	.5	.4	.4	.4
.4	.4	.4	.4	.4	.4	.8	.7	.5	.6	.5	.5	.5	.4	.4	.4	.4	.8	1.0	.8	.6	.6	.7	.8	1.0	1.9	2.5	3.3	1.7	.7	.5	.5	.4	.4	.4	.4
.4	.3	.4	.4	.4	.4	.5	.8	.5	.7	.5	.4	.4	.4	.3	.4	.7	1.1	1.6	1.5	.8	.7	.7	.8	.7	.6	1.7	1.4	1.0	.5	.5	.4	.3	.4	.4	.4
.4	.4	.5	.5	.5	.4	.4	.6	.6	.6	.6	.5	.3	.4	.3	.5	.7	.8	1.4	1.3	.8	.9	.9	.5	.4	.5	.4	.6	.7	.4	.6	.4	.4	.4	.4	.4
.8	.6	.7	.8	.7	.6	.6	.5	.5	.5	.8	.6	.6	.6	.6	.6	.5	.7	.8	1.1	1.1	1.0	.6	.4	.5	.6	.5	.6	.6	.7	.7	.6	.6	.7	.6	.6
.5	.4	.4	.4	.4	.4	.4	.4	.4	.5	.9	.9	.8	.7	.6	.5	.4	.4	.5	.9	1.1	1.0	.4	.5	.5	.5	.5	.6	.6	.8	.6	.9	1.0	1.0	.6	.6
.8	.6	.5	.5	.5	.4	.4	.4	.4	.4	.8	1.3	1.1	.7	.5	.4	.4	.4	.3	1.0	1.0	.9	.9	.4	.5	.5	.4	.4	.4	.4	.7	1.0	.8	.4	.6	.6
.6	.7	.5	.5	.5	.4	.4	.4	.4	.4	.5	1.7	.9	.7	.6	.4	.4	.4	.3	1.2	1.4	.6	.7	.5	.6	.4	.5	.4	.4	.7	.9	.8	.9	.7	.6	.4
.4	.5	.5	.6	.5	.4	.5	.4	.4	.4	.7	1.1	.8	.5	.5	.4	.5	.4	.4	.5	.9	.6	.5	.4	.4	.4	.4	.4	.4	.5	.6	.6	.7	.5	.5	.5
.4	.5	.4	.4	.5	.4	.4	.4	.4	.4	.7	.7	.5	.4	.4	.5	.4	.4	.4	.4	.4	.5	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.6
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.4	.5	.5	.5	.4	.4	.5	.5
.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.9	.6	.5	.4	.5	.5	.5	.5	.4	.5	.5	.7	.8	.6	.6	.8	.9	1.0	.8	.7	.8	.7	.6	.5	.5
.9	.9	.9	1.0	1.0	1.1	1.2	1.1	1.1	1.1	1.0	1.0	.6	.6	.7	1.1	1.1	1.1	1.1	1.3	1.4	1.4	1.4	1.3	1.1	1.3	1.5	1.8	1.7	1.7	1.7	1.3	1.1	1.1	1.1	.9
.6	.6	.8	.9	.8	.7	1.0	1.2	1.3	1.0	.8	.7	.8	.9	.9	1.1	1.2	1.2	1.1	1.1	1.1	1.1	1.3	1.4	1.5	1.6	1.4	1.2	1.2	1.1	1.1	1.0	1.0	1.5	1.1	.7

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



.4	.4	.5	.5	.5	.5	.5	.5	.5	.6	.6	.5	.4	.4	.4	.3	.3	.3	.3	.3	.3	.2	.2	.2	.2	.2	.2	.2	.3	.3	.4	.4	.4	.4	.4	.4
.5	.6	.7	.7	.7	.7	.7	.7	.8	.7	.7	.7	.6	.7	.7	.5	.4	.4	.4	.3	.3	.3	.2	.2	.1	.0	.0	.1	.1	.2	.2	.4	.5	.6	.6	.6
.7	.7	.6	.7	.7	.8	.8	.7	.8	.8	.8	.8	.7	.7	.7	.6	.8	.6	.5	.5	.4	.4	.3	.2	.1	.1	.1	.1	.2	.2	.3	.4	.5	.6	.7	.7
.7	.8	.5	.5	.5	.5	.7	.6	.7	.7	.7	.7	.6	.5	.5	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3	.2	.2	.2	.2	.3	.3	.4	.6	.5	.7	.7
.6	.7	.6	.5	.4	.3	.5	.5	.6	.6	.6	.5	.4	.4	.3	.3	.3	.3	.4	.2	.4	.3	.2	.4	.3	.4	.3	.3	.4	.3	.4	.5	.6	.6	.6	.7
.3	.2	.4	.3	.3	.3	.3	.3	.4	.3	.4	.3	.3	.3	.2	.3	.2	.3	.4	.2	.4	.2	.2	.4	.3	.4	.6	.5	.4	.3	.4	.4	.3	.4	.3	.4
.2	.1	.2	.2	.2	.2	.1	.2	.1	.1	.2	.2	.2	.2	.2	.3	.2	.2	.3	.2	.2	.1	.1	.2	.2	.2	.2	.1	.2	.1	.1	.2	.0	.2	.1	.1
.2	.1	.2	.2	.1	.2	.1	.1	.1	.1	.3	.2	.2	.1	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.2	.2	.1	.1	.1	.1	.1	.1	.1	.3	.2	.0
.3	.2	.2	.1	.1	.2	.1	.2	.2	.1	.3	.2	.2	.1	.1	.1	.1	.2	.1	.2	.1	.1	.2	.2	.3	.2	.2	.2	.2	.2	.1	.2	.2	.2	.3	.1
.3	.2	.1	.2	.2	.1	.2	.2	.2	.2	.3	.3	.3	.1	.2	.1	.2	.2	.1	.3	.2	.2	.2	.2	.4	.2	.2	.2	.2	.3	.3	.2	.2	.2	.2	.2
.3	.3	.2	.2	.2	.1	.2	.2	.2	.2	.2	.4	.3	.1	.2	.1	.2	.1	.1	.4	.1	.2	.2	.1	.2	.1	.2	.2	.1	.2	.2	.2	.3	.2	.2	.2
.2	.3	.2	.2	.3	.2	.3	.3	.3	.3	.2	.4	.3	.2	.2	.2	.3	.2	.2	.3	.2	.2	.2	.2	.2	.2	.2	.2	.2	.3	.3	.2	.3	.2	.2	.2
.3	.5	.3	.3	.4	.3	.4	.3	.4	.4	.4	.4	.4	.4	.4	.3	.4	.3	.4	.4	.4	.4	.3	.3	.3	.4	.4	.4	.4	.4	.4	.3	.4	.3	.4	.4
.4	.6	.5	.5	.5	.4	.5	.5	.5	.5	.5	.5	.5	.5	.5	.6	.5	.4	.6	.4	.5	.5	.5	.5	.4	.5	.5	.5	.6	.5	.6	.5	.6	.5	.5	.6
.6	.6	.7	.6	.6	.7	.7	.7	.6	.6	.6	.6	.6	.7	.6	.8	.7	.7	.7	.6	.7	.7	.7	.7	.6	.7	.7	.6	.7	.7	.7	.7	.6	.6	.6	.6
.7	.7	.8	.8	.7	.8	.8	.8	.7	.7	.8	.7	.7	.8	.8	.8	.8	.8	.7	.7	.7	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.7	.7	.7	.7
.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.8	.9	.8	.9	.9	.9	.8	.6	.7	.9	1.0	1.0	.9	.9	.9	.8	.8	.8	.8
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	.9	.9	.9	.9	.8	.8	.8	.8	.8	.9	.9	.9	.9	.9	.9	.9	.9	.9	1.0	1.0	1.0	1.0	1.0

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

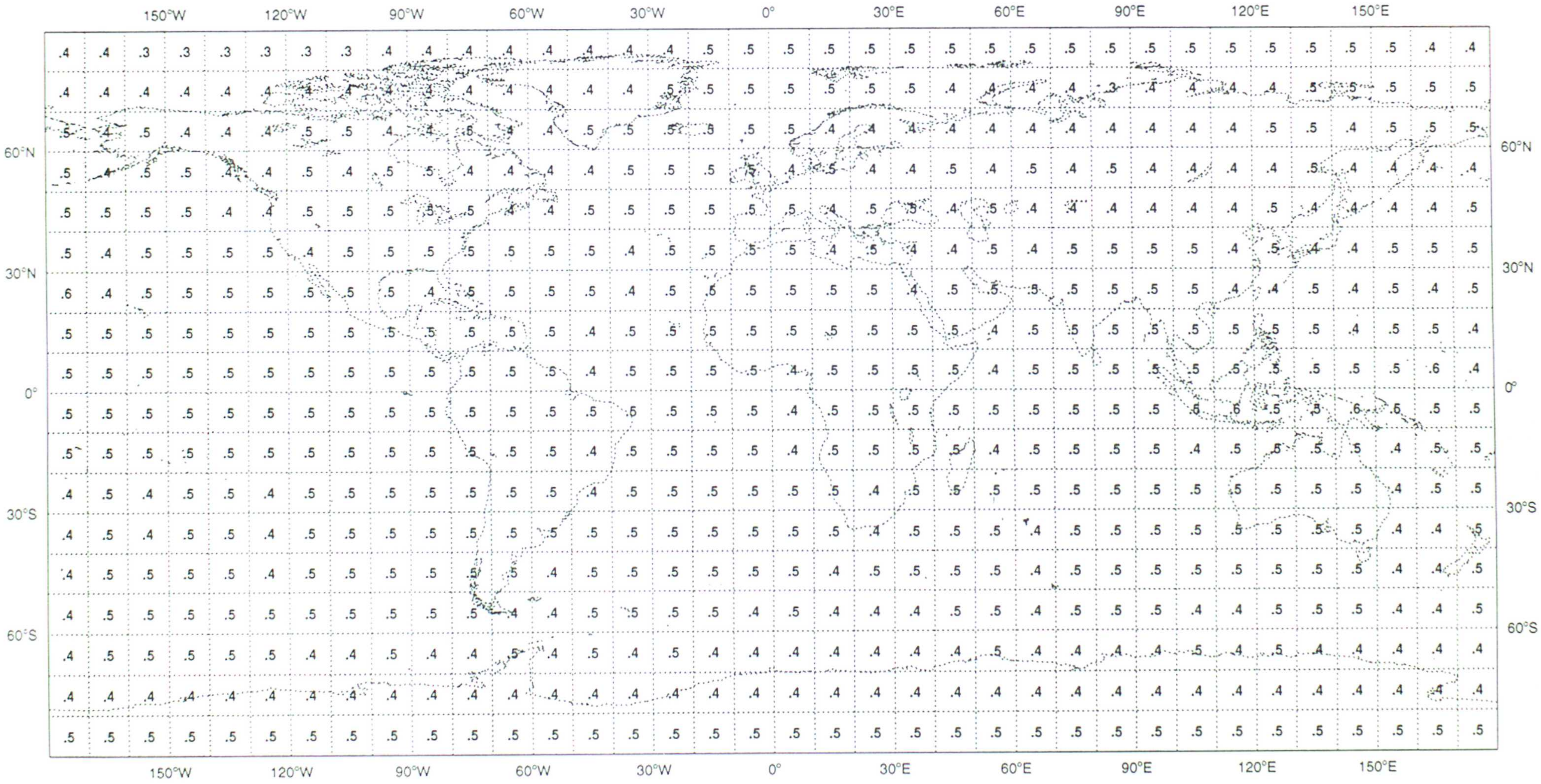

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

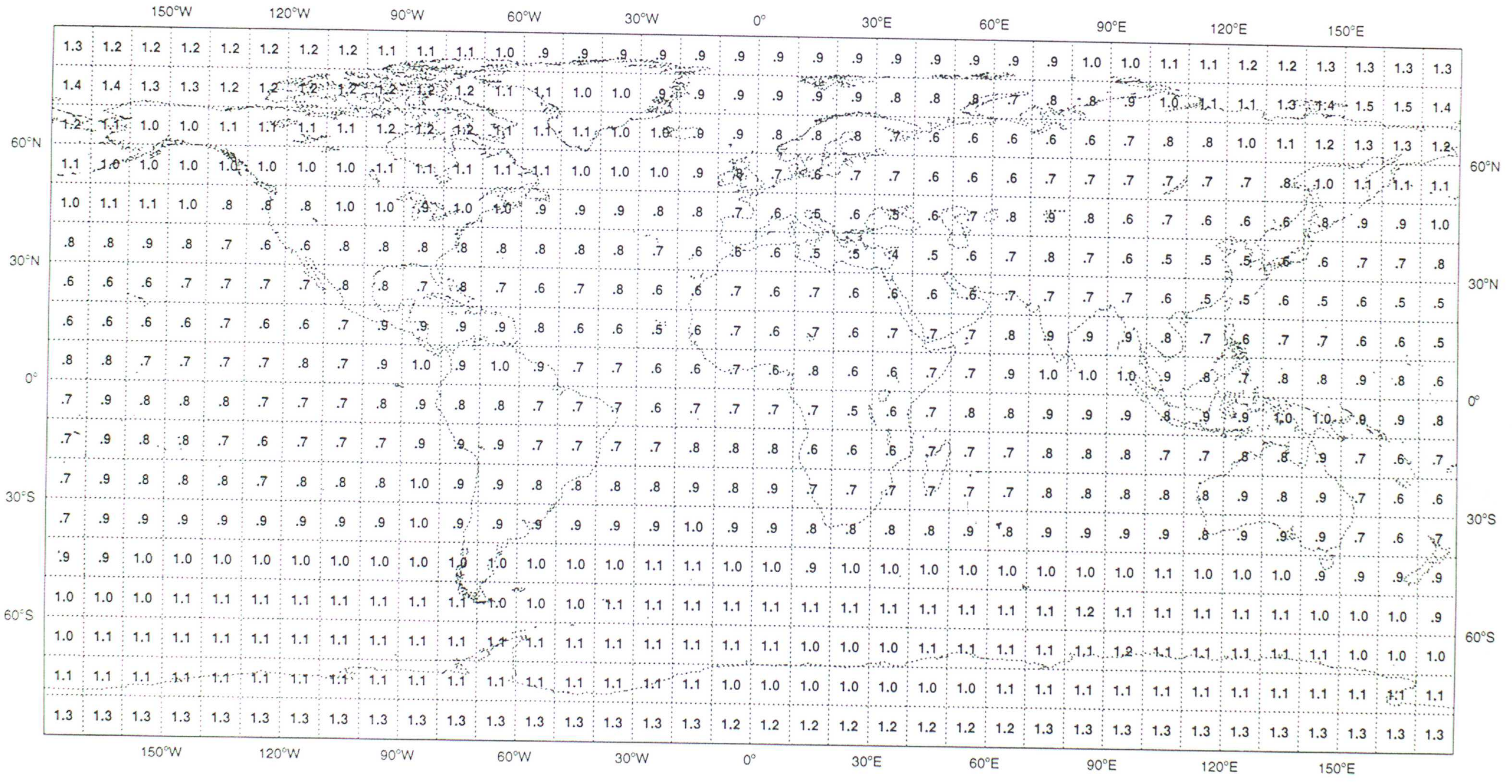

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
1.3 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.1 1.0 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 .9 1.0 1.0 1.1 1.1 1.2 1.2 1.3 1.3 1.3 1.3
1.4 1.4 1.3 1.3 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.0 1.0 .9 .9 .9 .9 .9 .9 .8 .8 .8 .7 .8 .8 .9 1.0 1.1 1.1 1.3 1.4 1.5 1.5 1.4
1.2 1.1 1.0 1.0 1.1 1.1 1.1 1.1 1.2 1.2 1.2 1.1 1.1 1.1 1.0 1.0 .9 .9 .8 .8 .8 .7 .6 .6 .6 .6 .6 .7 .8 .8 1.0 1.1 1.2 1.3 1.3 1.2
1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 .9 .8 .7 .6 .7 .7 .6 .6 .6 .7 .7 .7 .7 .7 .7 .8 1.0 1.1 1.1 1.1
1.0 1.1 1.1 1.0 .8 .8 .8 1.0 1.0 .9 1.0 1.0 .9 .9 .9 .8 .8 .7 .6 .5 .6 .5 .6 .7 .8 .9 .8 .6 .7 .6 .6 .6 .8 .9 .9 1.0
.8 .8 .9 .8 .7 .6 .6 .8 .8 .8 .8 .8 .8 .8 .8 .7 .6 .6 .6 .5 .5 .4 .5 .6 .7 .8 .7 .6 .5 .5 .5 .6 .6 .7 .7 .8
.6 .6 .6 .7 .7 .7 .7 .8 .8 .7 .8 .7 .6 .7 .8 .6 .6 .7 .6 .7 .6 .6 .6 .6 .7 .7 .7 .7 .6 .5 .5 .6 .5 .6 .5 .5
.6 .6 .6 .6 .7 .6 .6 .7 .9 .9 .9 .9 .8 .6 .6 .5 .6 .7 .6 .7 .6 .7 .7 .7 .8 .9 .9 .9 .8 .7 .6 .7 .7 .6 .6 .5
.8 .8 .7 .7 .7 .7 .8 .7 .9 1.0 .9 1.0 .9 .7 .7 .6 .6 .7 .6 .8 .6 .6 .7 .7 .9 1.0 1.0 1.0 .9 .8 .7 .8 .8 .9 .8 .6
.7 .9 .8 .8 .8 .7 .7 .7 .8 .9 .8 .8 .7 .7 .7 .6 .7 .7 .7 .7 .5 .6 .7 .8 .8 .9 .9 .9 .8 .9 .9 1.0 1.0 .9 .9 .8
.7 .9 .8 .8 .7 .6 .7 .7 .7 .9 .9 .9 .7 .7 .7 .7 .8 .8 .8 .6 .6 .6 .7 .7 .7 .8 .8 .8 .7 .7 .8 .8 .9 .7 .6 .7
.7 .9 .8 .8 .8 .7 .8 .8 .8 1.0 .9 .9 .8 .8 .8 .8 .9 .8 .9 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .9 .8 .9 .7 .6 .6
.7 .9 .9 .9 .9 .9 .9 .9 .9 1.0 .9 .9 .9 .9 .9 .9 1.0 .9 .9 .8 .8 .8 .8 .9 .8 .9 .9 .9 .9 .8 .9 .9 .9 .7 .6 .7
.9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.0 1.0 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.0 1.0 1.0 .9 .9 .9 .9
1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.2 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 .9
1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.2 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0
1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1
1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

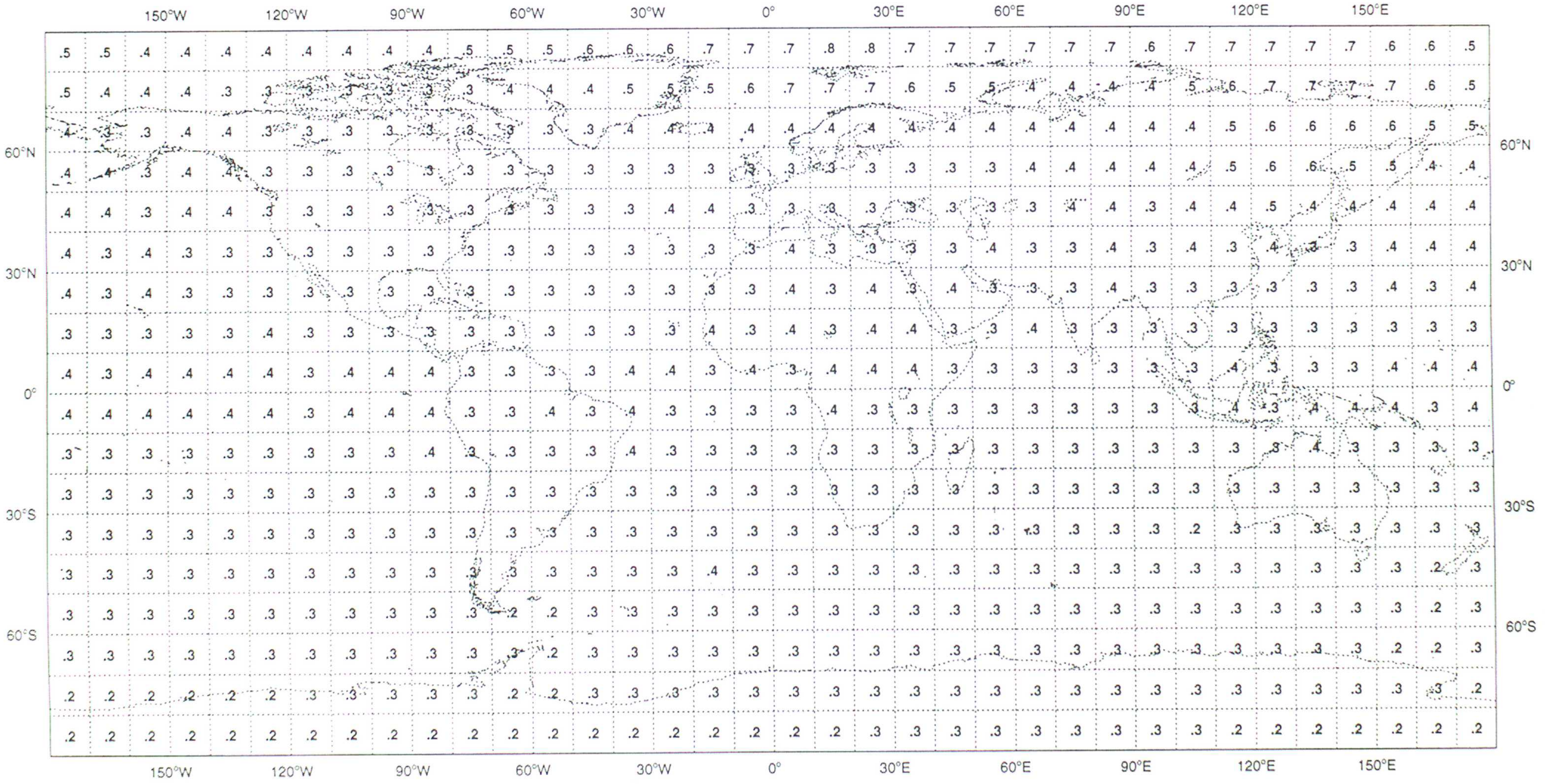
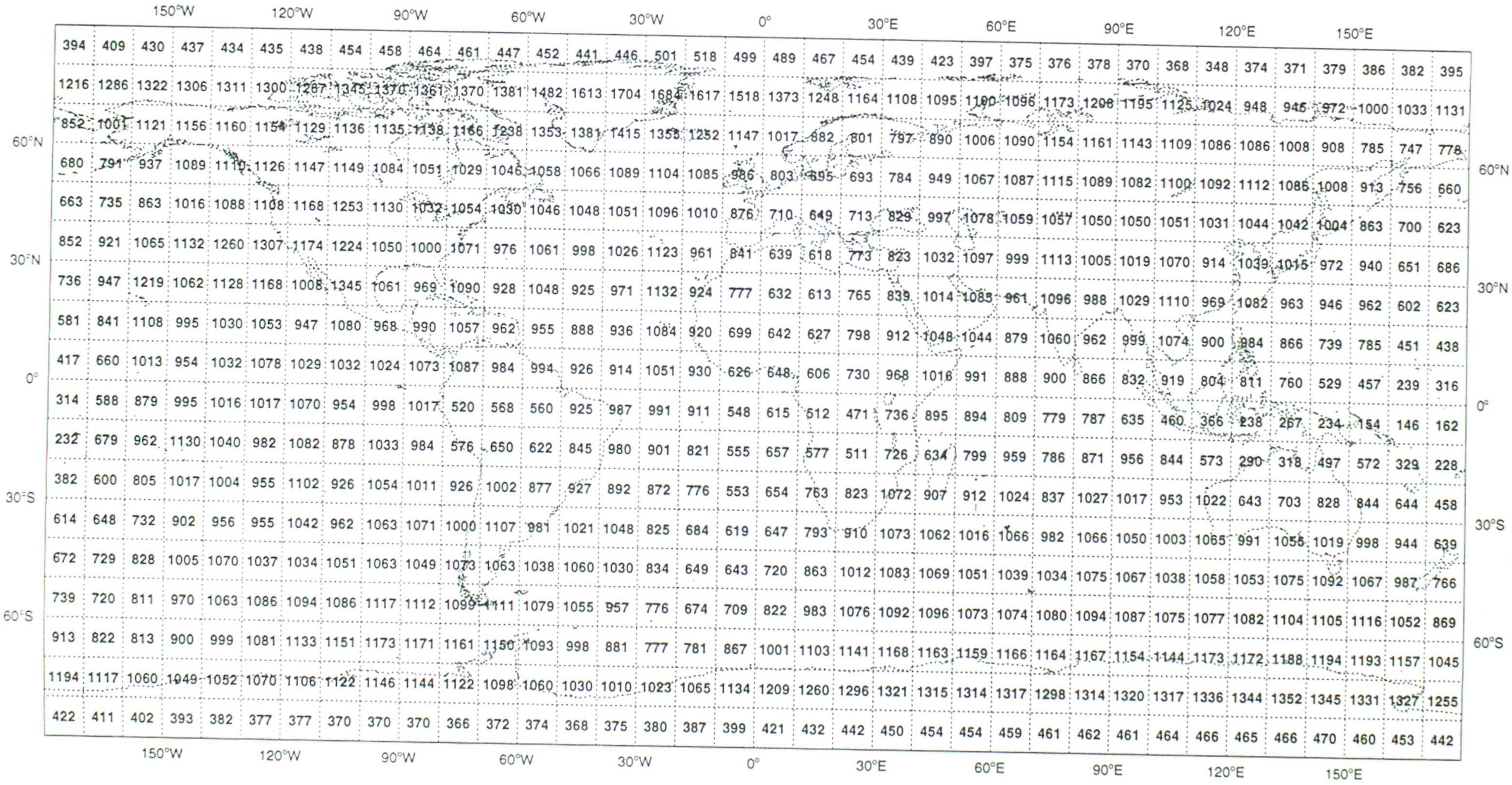

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .6 .6 .6 .7 .7 .7 .8 .8 .7 .7 .7 .7 .7 .7 .6 .7 .7 .7 .7 .7 .6 .6 .5
.5 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .5 .5 .5 .6 .7 .7 .7 .6 .5 .5 .4 .4 .4 .4 .5 .6 .7 .7 .7 .7 .6 .5
.4 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .6 .6 .6 .6 .5 .5
.4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .5 .6 .6 .5 .5 .4 .4
.4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3 .4 .4 .5 .4 .4 .4 .4 .4
.4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .4 .3 .4 .3 .4 .3 .3 .4 .4 .4
.4 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .3 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .4 .3 .4
.3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .3 .4 .4 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .3 .3 .3 .3 .4 .4 .3 .4 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .4 .4
.4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .3 .3 .4 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .4 .3 .4
.3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .3
.2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2 .2 .2 .2

Figure 40. ATOVS mean daily count. FEBRUARY 2002
NOAA16, using all observations
Global average number of observations in 24 hours = 585099



394	409	430	437	434	435	438	454	458	464	461	447	452	441	446	501	518	499	489	467	454	439	423	397	375	376	378	370	368	348	374	371	379	386	382	395
1216	1286	1322	1306	1311	1300	1267	1345	1370	1361	1370	1381	1482	1613	1704	1684	1617	1518	1373	1248	1164	1108	1095	1190	1096	1173	1208	1195	1125	1024	948	945	972	1000	1033	1131
852	1001	1121	1156	1160	1154	1129	1136	1135	1138	1166	1238	1353	1381	1415	1355	1252	1147	1017	882	801	797	890	1006	1090	1154	1161	1143	1109	1086	1086	1008	908	785	747	778
680	791	937	1089	1110	1126	1147	1149	1084	1051	1029	1046	1058	1066	1089	1104	1085	986	803	695	693	784	949	1067	1087	1115	1089	1082	1100	1092	1112	1086	1008	913	756	660
663	735	863	1016	1088	1108	1168	1253	1130	1032	1054	1030	1046	1048	1051	1096	1010	876	710	649	713	829	997	1078	1059	1057	1050	1050	1051	1031	1044	1042	1004	863	700	623
852	921	1065	1132	1260	1307	1174	1224	1050	1000	1071	976	1061	998	1026	1123	961	841	639	618	773	823	1032	1097	999	1113	1005	1019	1070	914	1039	1015	972	940	651	686
736	947	1219	1062	1128	1168	1008	1345	1061	969	1090	928	1048	925	971	1132	924	777	632	613	765	839	1014	1085	961	1096	988	1029	1110	969	1082	963	946	962	602	623
581	841	1108	995	1030	1053	947	1080	968	990	1057	962	955	888	936	1084	920	699	642	627	798	912	1048	1044	879	1060	962	999	1074	900	984	866	739	785	451	438
417	660	1013	954	1032	1078	1029	1032	1024	1073	1087	984	994	926	914	1051	930	626	648	606	730	968	1016	991	888	900	866	832	919	804	811	760	529	457	239	316
314	588	879	995	1016	1017	1070	954	998	1017	520	568	560	925	987	991	911	548	615	512	471	736	895	894	809	779	787	635	460	366	238	267	234	154	146	162
232	679	962	1130	1040	982	1082	878	1033	984	576	650	622	845	980	901	821	555	657	577	511	726	634	799	959	786	871	956	844	573	290	318	497	572	329	228
382	600	805	1017	1004	955	1102	926	1054	1011	926	1002	877	927	892	872	776	553	654	763	823	1072	907	912	1024	837	1027	1017	953	1022	643	703	828	844	644	458
614	648	732	902	956	955	1042	962	1063	1071	1000	1107	981	1021	1048	825	684	619	647	793	910	1073	1062	1016	1066	982	1066	1050	1003	1065	991	1055	1019	998	944	639
672	729	828	1005	1070	1037	1034	1051	1063	1049	1073	1063	1038	1060	1030	834	649	643	720	863	1012	1083	1069	1051	1039	1034	1075	1067	1038	1058	1053	1075	1092	1067	987	766
739	720	811	970	1063	1086	1094	1086	1117	1112	1099	1111	1079	1055	957	776	674	709	822	983	1076	1092	1096	1073	1074	1080	1094	1087	1075	1077	1082	1104	1105	1116	1052	869
913	822	813	900	999	1081	1133	1151	1173	1171	1161	1150	1093	998	881	777	781	867	1001	1103	1141	1168	1163	1159	1166	1164	1167	1154	1144	1173	1172	1188	1194	1193	1157	1045
1194	1117	1060	1049	1052	1070	1106	1122	1146	1144	1122	1098	1060	1030	1010	1023	1065	1134	1209	1260	1296	1321	1315	1314	1317	1298	1314	1320	1317	1336	1344	1352	1345	1331	1327	1255
422	411	402	393	382	377	377	370	370	370	366	372	374	368	375	380	387	399	421	432	442	450	454	454	459	461	462	461	464	466	465	466	470	460	453	442

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

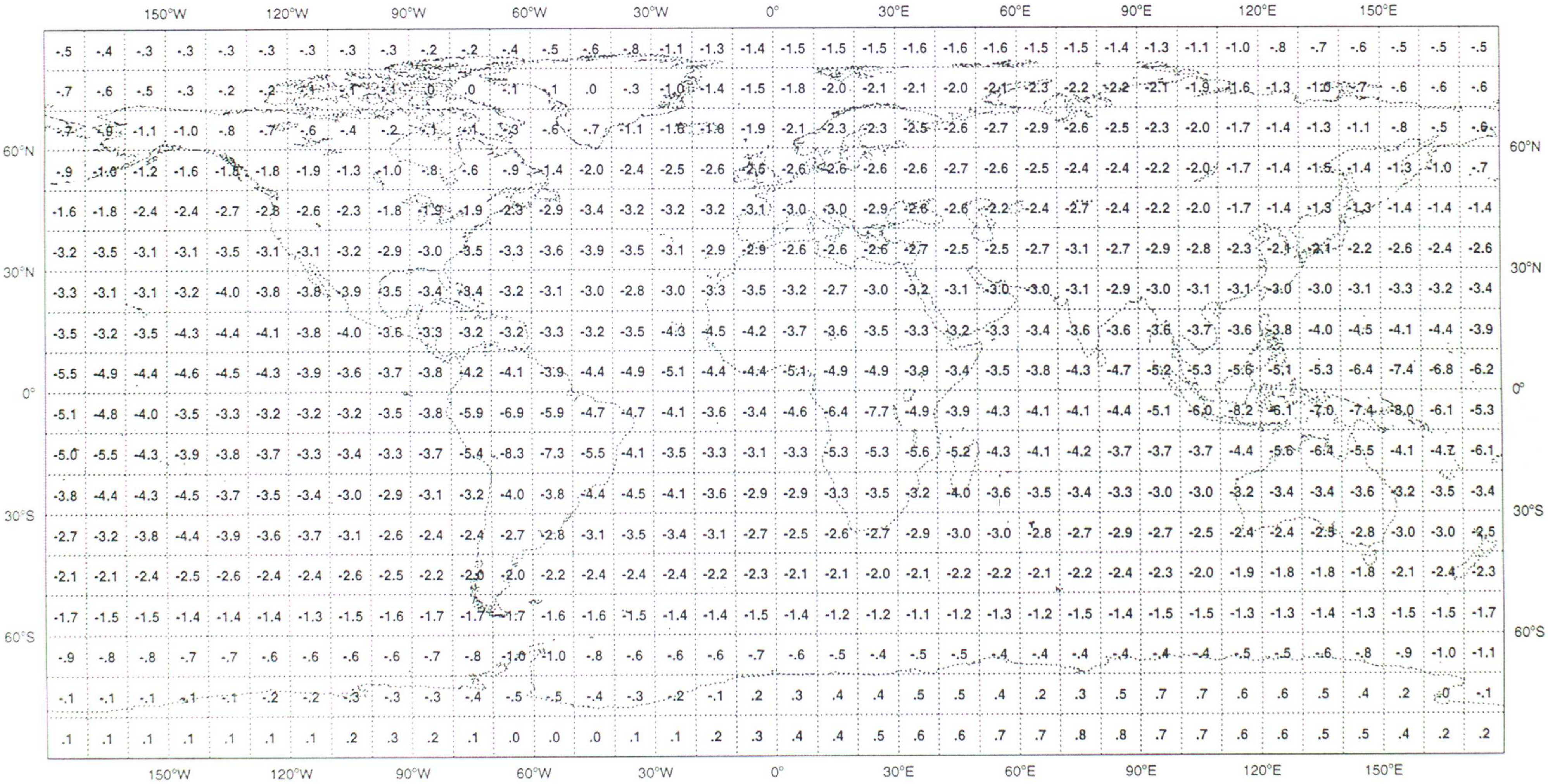

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.5 -.4 -.3 -.3 -.3 -.3 -.3 -.3 -.3 -.2 -.2 -.4 -.5 -.6 -.8 -1.1 -1.3 -1.4 -1.5 -1.5 -1.5 -1.6 -1.6 -1.6 -1.5 -1.5 -1.4 -1.3 -1.1 -1.0 -.8 -.7 -.6 -.5 -.5 -.5
-.7 -.6 -.5 -.3 -.2 -.2 -.1 -.1 -.1 .0 .0 -.1 .1 .0 -.3 -1.0 -1.4 -1.5 -1.8 -2.0 -2.1 -2.1 -2.0 -2.1 -2.3 -2.2 -2.2 -2.1 -1.9 -1.6 -1.3 -1.0 -.7 -.6 -.6 -.6
-.7 -.9 -1.1 -1.0 -.8 -.7 -.6 -.4 -.2 -.1 -.1 -.3 -.6 -.7 -1.1 -1.8 -1.8 -1.9 -2.1 -2.3 -2.3 -2.5 -2.6 -2.7 -2.9 -2.6 -2.5 -2.3 -2.0 -1.7 -1.4 -1.3 -1.1 -.8 -.5 -.6
-.9 -1.6 -1.2 -1.6 -1.8 -1.8 -1.9 -1.3 -1.0 -.8 -.6 -.9 -1.4 -2.0 -2.4 -2.5 -2.6 -2.5 -2.6 -2.6 -2.6 -2.6 -2.7 -2.6 -2.5 -2.4 -2.4 -2.2 -2.0 -1.7 -1.4 -1.5 -1.4 -1.3 -1.0 -.7
-1.6 -1.8 -2.4 -2.4 -2.7 -2.8 -2.6 -2.3 -1.8 -1.9 -1.9 -2.3 -2.9 -3.4 -3.2 -3.2 -3.2 -3.1 -3.0 -3.0 -2.9 -2.6 -2.6 -2.2 -2.4 -2.7 -2.4 -2.2 -2.0 -1.7 -1.4 -1.3 -1.3 -1.4 -1.4 -1.4
-3.2 -3.5 -3.1 -3.1 -3.5 -3.1 -3.1 -3.2 -2.9 -3.0 -3.5 -3.3 -3.6 -3.9 -3.5 -3.1 -2.9 -2.9 -2.6 -2.6 -2.6 -2.7 -2.5 -2.5 -2.7 -3.1 -2.7 -2.9 -2.8 -2.3 -2.1 -2.1 -2.2 -2.6 -2.4 -2.6
-3.3 -3.1 -3.1 -3.2 -4.0 -3.8 -3.8 -3.9 -3.5 -3.4 -3.4 -3.2 -3.1 -3.0 -2.8 -3.0 -3.3 -3.5 -3.2 -2.7 -3.0 -3.2 -3.1 -3.0 -3.0 -3.1 -2.9 -3.0 -3.1 -3.1 -3.0 -3.0 -3.1 -3.3 -3.2 -3.4
-3.5 -3.2 -3.5 -4.3 -4.4 -4.1 -3.8 -4.0 -3.6 -3.3 -3.2 -3.2 -3.3 -3.2 -3.5 -4.3 -4.5 -4.2 -3.7 -3.6 -3.5 -3.3 -3.2 -3.3 -3.4 -3.6 -3.6 -3.6 -3.7 -3.6 -3.8 -4.0 -4.5 -4.1 -4.4 -3.9
-5.5 -4.9 -4.4 -4.6 -4.5 -4.3 -3.9 -3.6 -3.7 -3.8 -4.2 -4.1 -3.9 -4.4 -4.9 -5.1 -4.4 -4.4 -5.1 -4.9 -4.9 -3.9 -3.4 -3.5 -3.8 -4.3 -4.7 -5.2 -5.3 -5.6 -5.1 -5.3 -6.4 -7.4 -6.8 -6.2
-5.1 -4.8 -4.0 -3.5 -3.3 -3.2 -3.2 -3.2 -3.5 -3.8 -5.9 -6.9 -5.9 -4.7 -4.7 -4.1 -3.6 -3.4 -4.6 -6.4 -7.7 -4.9 -3.9 -4.3 -4.1 -4.1 -4.4 -5.1 -6.0 -8.2 -6.1 -7.0 -7.4 -8.0 -6.1 -5.3
-5.0 -5.5 -4.3 -3.9 -3.8 -3.7 -3.3 -3.4 -3.3 -3.7 -5.4 -8.3 -7.3 -5.5 -4.1 -3.5 -3.3 -3.1 -3.3 -5.3 -5.3 -5.6 -5.2 -4.3 -4.1 -4.2 -3.7 -3.7 -3.7 -4.4 -5.6 -6.4 -5.5 -4.1 -4.7 -6.1
-3.8 -4.4 -4.3 -4.5 -3.7 -3.5 -3.4 -3.0 -2.9 -3.1 -3.2 -4.0 -3.8 -4.4 -4.5 -4.1 -3.6 -2.9 -2.9 -3.3 -3.5 -3.2 -4.0 -3.6 -3.5 -3.4 -3.3 -3.0 -3.0 -3.2 -3.4 -3.4 -3.6 -3.2 -3.5 -3.4
-2.7 -3.2 -3.8 -4.4 -3.9 -3.6 -3.7 -3.1 -2.6 -2.4 -2.4 -2.7 -2.8 -3.1 -3.5 -3.4 -3.1 -2.7 -2.5 -2.6 -2.7 -2.9 -3.0 -3.0 -2.8 -2.7 -2.9 -2.7 -2.5 -2.4 -2.4 -2.5 -2.8 -3.0 -3.0 -2.5
-2.1 -2.1 -2.4 -2.5 -2.6 -2.4 -2.4 -2.6 -2.5 -2.2 -2.0 -2.0 -2.2 -2.4 -2.4 -2.4 -2.2 -2.3 -2.1 -2.1 -2.0 -2.1 -2.2 -2.2 -2.1 -2.2 -2.4 -2.3 -2.0 -1.9 -1.8 -1.8 -1.8 -2.1 -2.4 -2.3
-1.7 -1.5 -1.5 -1.4 -1.4 -1.4 -1.3 -1.5 -1.6 -1.7 -1.7 -1.7 -1.6 -1.6 -1.5 -1.4 -1.4 -1.5 -1.4 -1.2 -1.2 -1.1 -1.2 -1.3 -1.2 -1.5 -1.4 -1.5 -1.5 -1.3 -1.3 -1.4 -1.3 -1.5 -1.5 -1.7
-.9 -.8 -.8 -.7 -.7 -.6 -.6 -.6 -.6 -.7 -.8 -1.0 -1.0 -.8 -.6 -.6 -.6 -.7 -.6 -.5 -.4 -.5 -.5 -.4 -.4 -.4 -.4 -.4 -.4 -.5 -.5 -.6 -.8 -.9 -1.0 -1.1
-.1 -.1 -.1 -.1 -.1 -.2 -.2 -.3 -.3 -.3 -.4 -.5 -.5 -.4 -.3 -.2 -.1 .2 .3 .4 .4 .5 .5 .4 .2 .3 .5 .7 .7 .6 .6 .5 .4 .2 .0 -.1
.1 .1 .1 .1 .1 .1 .1 .2 .3 .2 .1 .0 .0 .0 .1 .1 .2 .3 .4 .4 .5 .6 .6 .7 .7 .8 .8 .7 .7 .6 .6 .5 .5 .4 .2 .2

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

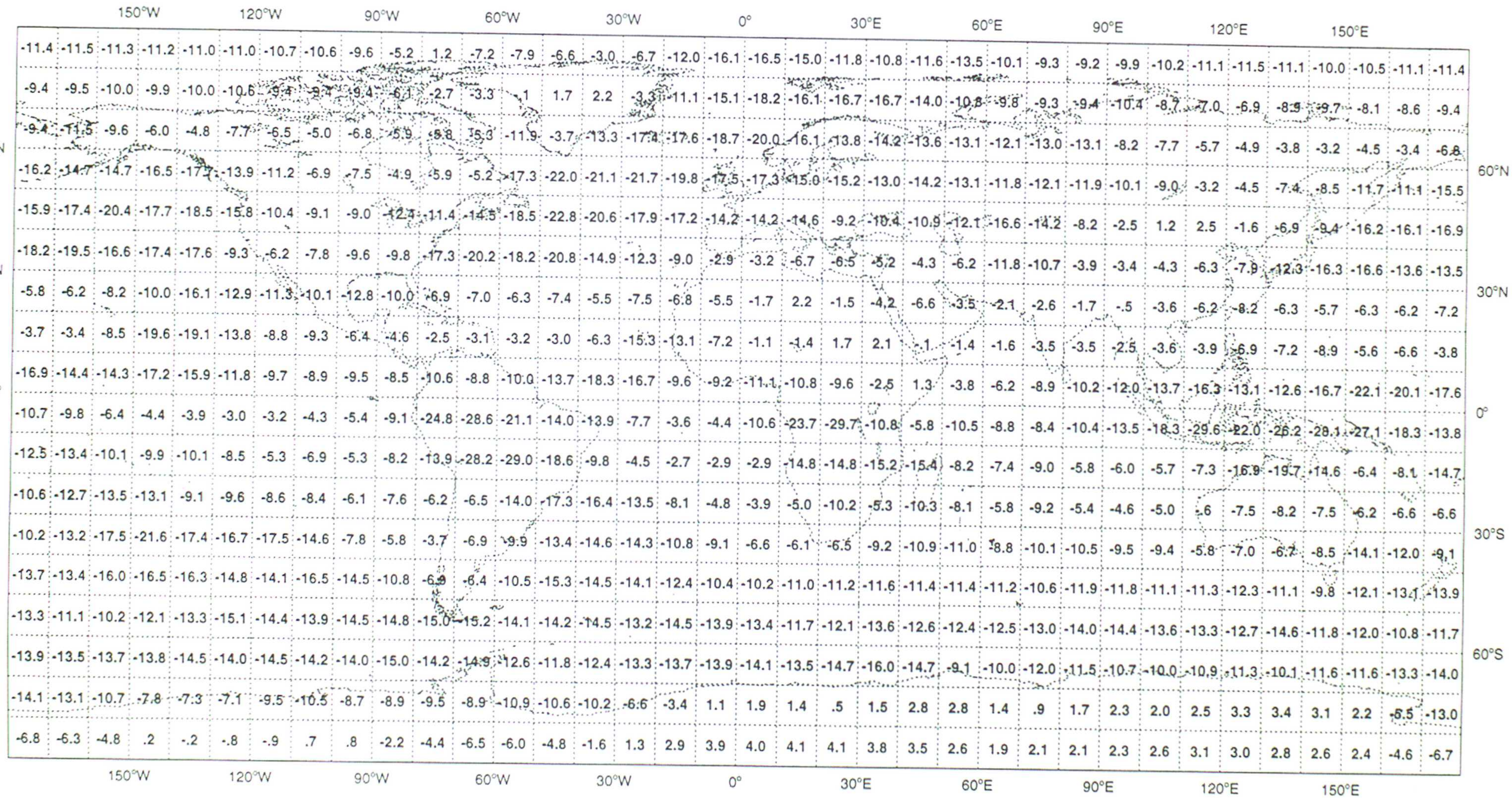
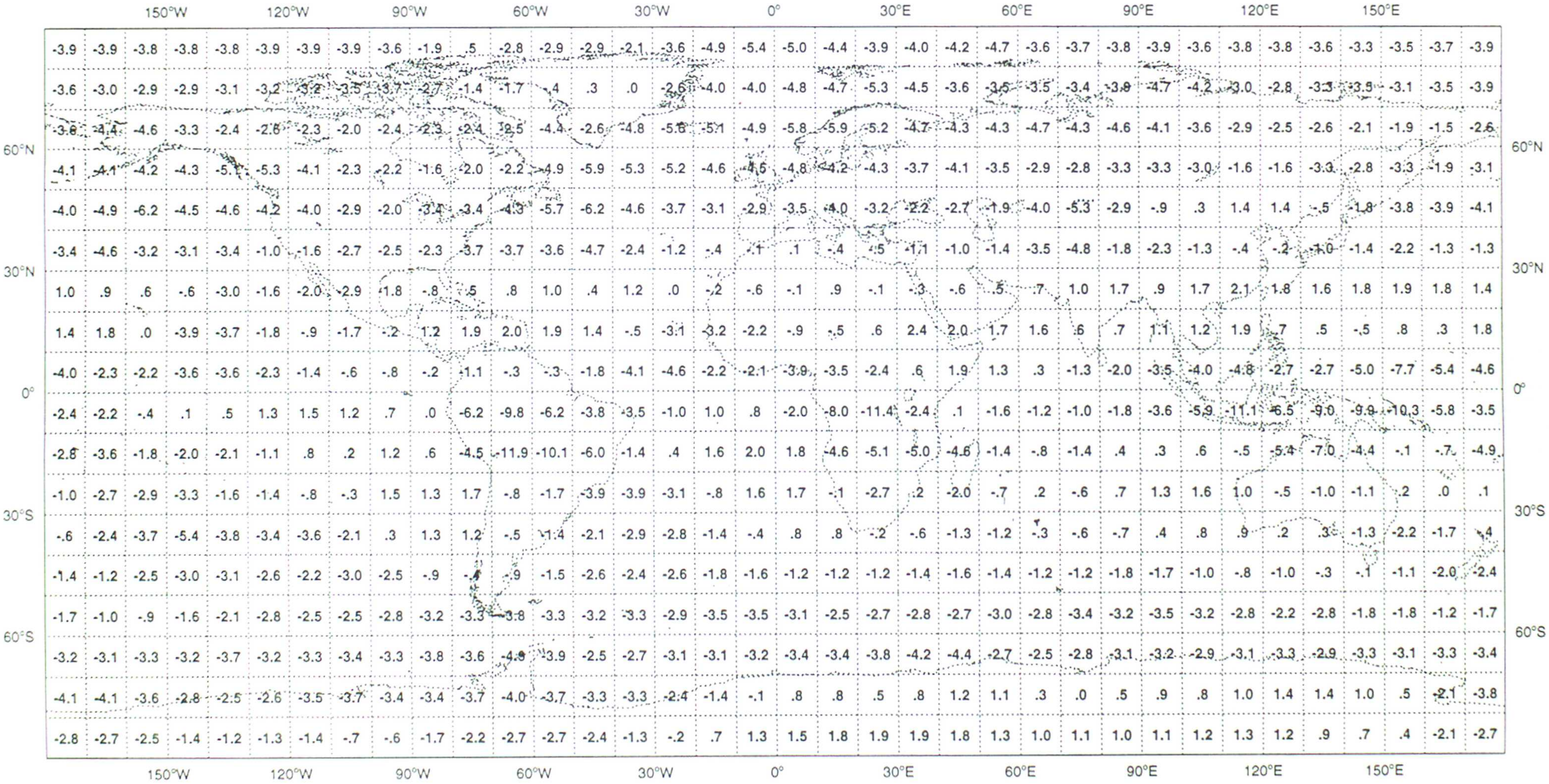

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-11.4 -11.5 -11.3 -11.2 -11.0 -11.0 -10.7 -10.6 -9.6 -5.2 1.2 -7.2 -7.9 -6.6 -3.0 -6.7 -12.0 -16.1 -16.5 -15.0 -11.8 -10.8 -11.6 -13.5 -10.1 -9.3 -9.2 -9.9 -10.2 -11.1 -11.5 -11.1 -10.0 -10.5 -11.1 -11.4
-9.4 -9.5 -10.0 -9.9 -10.0 -10.6 -9.4 -9.7 -9.4 -6.1 -2.7 -3.3 -.1 1.7 2.2 -3.3 -11.1 -15.1 -18.2 -16.1 -16.7 -16.7 -14.0 -10.8 -9.8 -9.3 -9.4 -10.4 -8.7 -7.0 -6.9 -8.9 -9.7 -8.1 -8.6 -9.4
-9.4 -11.5 -9.6 -6.0 -4.8 -7.7 -6.5 -5.0 -6.8 -5.9 -5.8 -5.3 -11.9 -3.7 -13.3 -17.4 -17.6 -18.7 -20.0 -16.1 -13.8 -14.2 -13.6 -13.1 -12.1 -13.0 -13.1 -8.2 -7.7 -5.7 -4.9 -3.8 -3.2 -4.5 -3.4 -6.8
-16.2 -14.7 -14.7 -16.5 -17.7 -13.9 -11.2 -6.9 -7.5 -4.9 -5.9 -5.2 -17.3 -22.0 -21.1 -21.7 -19.8 -17.5 -17.3 -15.0 -15.2 -13.0 -14.2 -13.1 -11.8 -12.1 -11.9 -10.1 -9.0 -3.2 -4.5 -7.4 -8.5 -11.7 -11.1 -15.5
-15.9 -17.4 -20.4 -17.7 -18.5 -15.8 -10.4 -9.1 -9.0 -12.4 -11.4 -14.5 -18.5 -22.8 -20.6 -17.9 -17.2 -14.2 -14.2 -14.6 -9.2 -10.4 -10.9 -12.1 -16.6 -14.2 -8.2 -2.5 1.2 2.5 -1.6 -6.9 -9.4 -16.2 -16.1 -16.9
-18.2 -19.5 -16.6 -17.4 -17.6 -9.3 -6.2 -7.8 -9.6 -9.8 -17.3 -20.2 -18.2 -20.8 -14.9 -12.3 -9.0 -2.9 -3.2 -6.7 -6.5 -5.2 -4.3 -6.2 -11.8 -10.7 -3.9 -3.4 -4.3 -6.3 -7.9 -12.3 -16.3 -16.6 -13.6 -13.5
-5.8 -6.2 -8.2 -10.0 -16.1 -12.9 -11.3 -10.1 -12.8 -10.0 -6.9 -7.0 -6.3 -7.4 -5.5 -7.5 -6.8 -5.5 -1.7 2.2 -1.5 -4.2 -6.6 -3.5 -2.1 -2.6 -1.7 -.5 -3.6 -6.2 -8.2 -6.3 -5.7 -6.3 -6.2 -7.2
-3.7 -3.4 -8.5 -19.6 -19.1 -13.8 -8.8 -9.3 -6.4 -4.6 -2.5 -3.1 -3.2 -3.0 -6.3 -15.3 -13.1 -7.2 -1.1 -1.4 1.7 2.1 -.1 -1.4 -1.6 -3.5 -3.5 -2.5 -3.6 -3.9 -6.9 -7.2 -8.9 -5.6 -6.6 -3.8
-16.9 -14.4 -14.3 -17.2 -15.9 -11.8 -9.7 -8.9 -9.5 -8.5 -10.6 -8.8 -10.0 -13.7 -18.3 -16.7 -9.6 -9.2 -11.1 -10.8 -9.6 -2.5 1.3 -3.8 -6.2 -8.9 -10.2 -12.0 -13.7 -16.3 -13.1 -12.6 -16.7 -22.1 -20.1 -17.6
-10.7 -9.8 -6.4 -4.4 -3.9 -3.0 -3.2 -4.3 -5.4 -9.1 -24.8 -28.6 -21.1 -14.0 -13.9 -7.7 -3.6 -4.4 -10.6 -23.7 -29.7 -10.8 -5.8 -10.5 -8.8 -8.4 -10.4 -13.5 -18.3 -29.6 -22.0 -26.2 -28.1 -27.1 -18.3 -13.8
-12.5 -13.4 -10.1 -9.9 -10.1 -8.5 -5.3 -6.9 -5.3 -8.2 -13.9 -28.2 -29.0 -18.6 -9.8 -4.5 -2.7 -2.9 -2.9 -14.8 -14.8 -15.2 -15.4 -8.2 -7.4 -9.0 -5.8 -6.0 -5.7 -7.3 -16.9 -19.7 -14.6 -6.4 -8.1 -14.7
-10.6 -12.7 -13.5 -13.1 -9.1 -9.6 -8.6 -8.4 -6.1 -7.6 -6.2 -6.5 -14.0 -17.3 -16.4 -13.5 -8.1 -4.8 -3.9 -5.0 -10.2 -5.3 -10.3 -8.1 -5.8 -9.2 -5.4 -4.6 -5.0 -.6 -7.5 -8.2 -7.5 -6.2 -6.6 -6.6
-10.2 -13.2 -17.5 -21.6 -17.4 -16.7 -17.5 -14.6 -7.8 -5.8 -3.7 -6.9 -9.9 -13.4 -14.6 -14.3 -10.8 -9.1 -6.6 -6.1 -6.5 -9.2 -10.9 -11.0 -8.8 -10.1 -10.5 -9.5 -9.4 -5.8 -7.0 -6.7 -8.5 -14.1 -12.0 -9.1
-13.7 -13.4 -16.0 -16.5 -16.3 -14.8 -14.1 -16.5 -14.5 -10.8 -6.9 -6.4 -10.5 -15.3 -14.5 -14.1 -12.4 -10.4 -10.2 -11.0 -11.2 -11.6 -11.4 -11.4 -11.2 -10.6 -11.9 -11.8 -11.1 -11.3 -12.3 -11.1 -9.8 -12.1 -13.1 -13.9
-13.3 -11.1 -10.2 -12.1 -13.3 -15.1 -14.4 -13.9 -14.5 -14.8 -15.0 -15.2 -14.1 -14.2 -14.5 -13.2 -14.5 -13.9 -13.4 -11.7 -12.1 -13.6 -12.6 -12.4 -12.5 -13.0 -14.0 -14.4 -13.6 -13.3 -12.7 -14.6 -11.8 -12.0 -10.8 -11.7
-13.9 -13.5 -13.7 -13.8 -14.5 -14.0 -14.5 -14.2 -14.0 -15.0 -14.2 -14.9 -12.6 -11.8 -12.4 -13.3 -13.7 -13.9 -14.1 -13.5 -14.7 -16.0 -14.7 -9.1 -10.0 -12.0 -11.5 -10.7 -10.0 -10.9 -11.3 -10.1 -11.6 -11.6 -13.3 -14.0
-14.1 -13.1 -10.7 -7.8 -7.3 -7.1 -9.5 -10.5 -8.7 -8.9 -9.5 -8.9 -10.9 -10.6 -10.2 -6.6 -3.4 1.1 1.9 1.4 .5 1.5 2.8 2.8 1.4 .9 1.7 2.3 2.0 2.5 3.3 3.4 3.1 2.2 -6.5 -13.0
-6.8 -6.3 -4.8 .2 -.2 -.8 -.9 .7 .8 -2.2 -4.4 -6.5 -6.0 -4.8 -1.6 1.3 2.9 3.9 4.0 4.1 4.1 3.8 3.5 2.6 1.9 2.1 2.1 2.3 2.6 3.1 3.0 2.8 2.6 2.4 -4.6 -6.7
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002

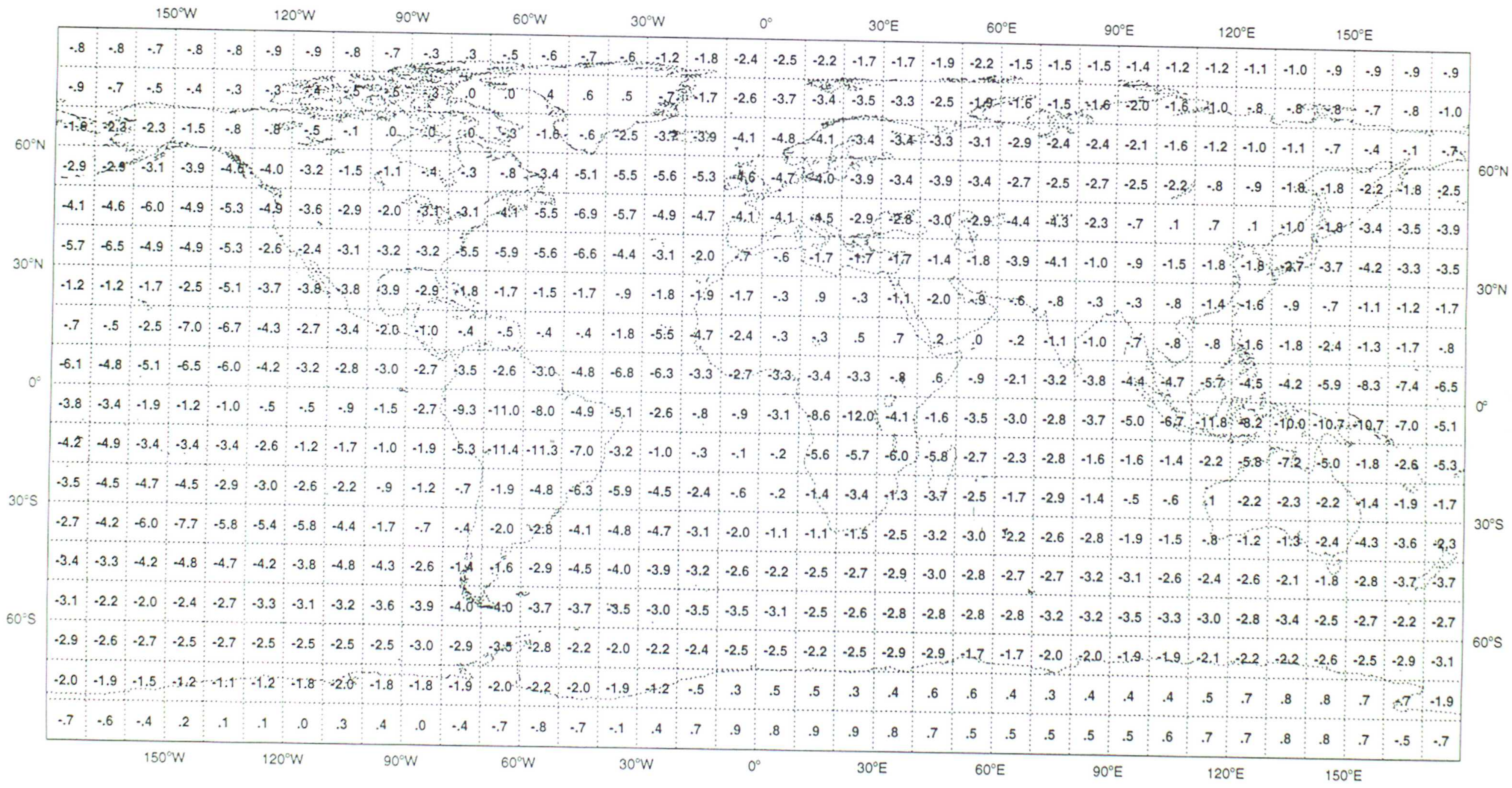
Channel: HIRS15 (700 hPa)

NOAA16, using all observations



-3.9	-3.9	-3.8	-3.8	-3.8	-3.9	-3.9	-3.9	-3.6	-1.9	.5	-2.8	-2.9	-2.9	-2.1	-3.6	-4.9	-5.4	-5.0	-4.4	-3.9	-4.0	-4.2	-4.7	-3.6	-3.7	-3.8	-3.9	-3.6	-3.8	-3.8	-3.6	-3.3	-3.5	-3.7	-3.9
-3.6	-3.0	-2.9	-2.9	-3.1	-3.2	-3.2	-3.5	-3.7	-2.7	-1.4	-1.7	.4	.3	.0	-2.6	-4.0	-4.0	-4.8	-4.7	-5.3	-4.5	-3.6	-3.5	-3.5	-3.4	-3.8	-4.7	-4.2	-3.0	-2.8	-3.3	-3.5	-3.1	-3.5	-3.9
-3.6	-4.4	-4.6	-3.3	-2.4	-2.6	-2.3	-2.0	-2.4	-2.3	-2.4	-2.5	-4.4	-2.6	-4.8	-5.6	-5.1	-4.9	-5.8	-5.9	-5.2	-4.7	-4.3	-4.3	-4.7	-4.3	-4.6	-4.1	-3.6	-2.9	-2.5	-2.6	-2.1	-1.9	-1.5	-2.6
-4.1	-4.1	-4.2	-4.3	-5.1	-5.3	-4.1	-2.3	-2.2	-1.6	-2.0	-2.2	-4.9	-5.9	-5.3	-5.2	-4.6	-4.5	-4.8	-4.2	-4.3	-3.7	-4.1	-3.5	-2.9	-2.8	-3.3	-3.3	-3.0	-1.6	-1.6	-3.3	-2.8	-3.3	-1.9	-3.1
-4.0	-4.9	-6.2	-4.5	-4.6	-4.2	-4.0	-2.9	-2.0	-3.4	-3.4	-4.3	-5.7	-6.2	-4.6	-3.7	-3.1	-2.9	-3.5	-4.0	-3.2	-2.2	-2.7	-1.9	-4.0	-5.3	-2.9	-.9	.3	1.4	1.4	-.5	-1.8	-3.8	-3.9	-4.1
-3.4	-4.6	-3.2	-3.1	-3.4	-1.0	-1.6	-2.7	-2.5	-2.3	-3.7	-3.7	-3.6	-4.7	-2.4	-1.2	-.4	-.1	.1	-.4	.5	-1.1	-1.0	-1.4	-3.5	-4.8	-1.8	-2.3	-1.3	-.4	-.2	-1.0	-1.4	-2.2	-1.3	-1.3
1.0	.9	.6	-.6	-3.0	-1.6	-2.0	-2.9	1.8	-.8	.5	.8	1.0	.4	1.2	.0	-.2	-.6	-.1	.9	-.1	-.3	-.6	.5	.7	1.0	1.7	.9	1.7	2.1	1.8	1.6	1.8	1.9	1.8	1.4
1.4	1.8	.0	-3.9	-3.7	-1.8	-.9	-1.7	-.2	1.2	1.9	2.0	1.9	1.4	-.5	-3.1	-3.2	-2.2	-.9	-.5	.6	2.4	2.0	1.7	1.6	.6	.7	1.1	1.2	1.9	.7	.5	-.5	.8	.3	1.8
-4.0	-2.3	-2.2	-3.6	-3.6	-2.3	-1.4	-.6	-.8	-.2	-1.1	-.3	-.3	-1.8	-4.1	-4.6	-2.2	-2.1	-3.9	-3.5	-2.4	.6	1.9	1.3	.3	-1.3	-2.0	-3.5	-4.0	-4.8	-2.7	-2.7	-5.0	-7.7	-5.4	-4.6
-2.4	-2.2	-.4	.1	.5	1.3	1.5	1.2	.7	.0	-6.2	-9.8	-6.2	-3.8	-3.5	-1.0	1.0	.8	-2.0	-8.0	-11.4	-2.4	.1	-1.6	-1.2	-1.0	-1.8	-3.6	-5.9	-11.1	-6.5	-9.0	-9.9	-10.3	-5.8	-3.5
-2.8	-3.6	-1.8	-2.0	-2.1	-1.1	.8	.2	1.2	.6	-4.5	-11.9	-10.1	-6.0	-1.4	.4	1.6	2.0	1.8	-4.6	-5.1	-5.0	-4.6	-1.4	-.8	-1.4	.4	.3	.6	-.5	-5.4	-7.0	-4.4	-.1	-.7	-4.9
-1.0	-2.7	-2.9	-3.3	-1.6	-1.4	-.8	-.3	1.5	1.3	1.7	-.8	-1.7	-3.9	-3.9	-3.1	-.8	1.6	1.7	-.1	-2.7	.2	-2.0	-.7	.2	-.6	.7	1.3	1.6	1.0	-.5	-1.0	-1.1	.2	.0	.1
-.6	-2.4	-3.7	-5.4	-3.8	-3.4	-3.6	-2.1	.3	1.3	1.2	-.5	-1.4	-2.1	-2.9	-2.8	-1.4	-.4	.8	.8	-.2	-.6	-1.3	-1.2	-.3	-.6	-.7	.4	.8	.9	.2	.3	-1.3	-2.2	-1.7	.4
-1.4	-1.2	-2.5	-3.0	-3.1	-2.6	-2.2	-3.0	-2.5	-.9	-.4	-.9	-1.5	-2.6	-2.4	-2.6	-1.8	-1.6	-1.2	-1.2	-1.2	-1.4	-1.6	-1.4	-1.2	-1.2	-1.8	-1.7	-1.0	-.8	-1.0	-.3	-.1	-1.1	-2.0	-2.4
-1.7	-1.0	-.9	-1.6	-2.1	-2.8	-2.5	-2.5	-2.8	-3.2	-3.3	-3.8	-3.3	-3.2	-3.3	-2.9	-3.5	-3.5	-3.1	-2.5	-2.7	-2.8	-2.7	-3.0	-2.8	-3.4	-3.2	-3.5	-3.2	-2.8	-2.2	-2.8	-1.8	-1.8	-1.2	-1.7
-3.2	-3.1	-3.3	-3.2	-3.7	-3.2	-3.3	-3.4	-3.3	-3.8	-3.6	-4.9	-3.9	-2.5	-2.7	-3.1	-3.1	-3.2	-3.4	-3.4	-3.8	-4.2	-4.4	-2.7	-2.5	-2.8	-3.1	-3.2	-2.9	-3.1	-3.3	-2.9	-3.3	-3.1	-3.3	-3.4
-4.1	-4.1	-3.6	-2.8	-2.5	-2.6	-3.5	-3.7	-3.4	-3.4	-3.7	-4.0	-3.7	-3.3	-3.3	-2.4	-1.4	-.1	.8	.8	.5	.8	1.2	1.1	.3	.0	.5	.9	.8	1.0	1.4	1.4	1.0	.5	-2.1	-3.8
-2.8	-2.7	-2.5	-1.4	-1.2	-1.3	-1.4	-.7	-.6	-1.7	-2.2	-2.7	-2.7	-2.4	-1.3	-.2	.7	1.3	1.5	1.8	1.9	1.9	1.8	1.3	1.0	1.1	1.0	1.1	1.2	1.3	1.2	.9	.7	.4	-2.1	-2.7

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



-.8	-.8	-.7	-.8	-.8	-.9	-.9	-.8	-.7	-.3	.3	-.5	-.6	-.7	-.6	-1.2	-1.8	-2.4	-2.5	-2.2	-1.7	-1.7	-1.9	-2.2	-1.5	-1.5	-1.5	-1.4	-1.2	-1.2	-1.1	-1.0	-.9	-.9	-.9	-.9
-.9	-.7	-.5	-.4	-.3	-.3	-.4	-.5	-.5	-.3	.0	.0	.4	.6	.5	-.7	-1.7	-2.6	-3.7	-3.4	-3.5	-3.3	-2.5	-1.9	-1.6	-1.5	-1.6	-2.0	-1.6	-1.0	-.8	-.8	-.8	-.7	-.8	-1.0
-1.8	-2.3	-2.3	-1.5	-.8	-.8	-.5	-.1	.0	.0	.0	-.3	-1.8	-.6	-2.5	-3.7	-3.9	-4.1	-4.8	-4.1	-3.4	-3.4	-3.3	-3.1	-2.9	-2.4	-2.4	-2.1	-1.6	-1.2	-1.0	-1.1	-.7	-.4	-.1	-.7
-2.9	-2.9	-3.1	-3.9	-4.6	-4.0	-3.2	-1.5	-1.1	-.4	-.3	-.8	-3.4	-5.1	-5.5	-5.6	-5.3	-4.6	-4.7	-4.0	-3.9	-3.4	-3.9	-3.4	-2.7	-2.5	-2.7	-2.5	-2.2	-.8	-.9	-1.8	-1.8	-2.2	-1.8	-2.5
-4.1	-4.6	-6.0	-4.9	-5.3	-4.9	-3.6	-2.9	-2.0	-3.1	-3.1	-4.1	-5.5	-6.9	-5.7	-4.9	-4.7	-4.1	-4.1	-4.5	-2.9	-2.8	-3.0	-2.9	-4.4	-4.3	-2.3	-.7	.1	.7	.1	-1.0	-1.8	-3.4	-3.5	-3.9
-5.7	-6.5	-4.9	-4.9	-5.3	-2.6	-2.4	-3.1	-3.2	-3.2	-5.5	-5.9	-5.6	-6.6	-4.4	-3.1	-2.0	-.7	-.6	-1.7	-1.7	-1.7	-1.4	-1.8	-3.9	-4.1	-1.0	-.9	-1.5	-1.8	-1.8	-2.7	-3.7	-4.2	-3.3	-3.5
-1.2	-1.2	-1.7	-2.5	-5.1	-3.7	-3.8	-3.8	-3.9	-2.9	-1.8	-1.7	-1.5	-1.7	-.9	-1.8	-1.9	-1.7	-.3	.9	-.3	-1.1	-2.0	-.9	-.6	-.8	-.3	-.3	-.8	-1.4	-1.6	-.9	-.7	-1.1	-1.2	-1.7
-.7	-.5	-2.5	-7.0	-6.7	-4.3	-2.7	-3.4	-2.0	-1.0	-.4	-.5	-.4	-.4	-1.8	-5.5	-4.7	-2.4	-.3	-.3	.5	.7	.2	.0	-.2	-1.1	-1.0	-.7	-.8	-.8	-1.6	-1.8	-2.4	-1.3	-1.7	-.8
-6.1	-4.8	-5.1	-6.5	-6.0	-4.2	-3.2	-2.8	-3.0	-2.7	-3.5	-2.6	-3.0	-4.8	-6.8	-6.3	-3.3	-2.7	-3.3	-3.4	-3.3	-.8	.6	-.9	-2.1	-3.2	-3.8	-4.4	-4.7	-5.7	-4.5	-4.2	-5.9	-8.3	-7.4	-6.5
-3.8	-3.4	-1.9	-1.2	-1.0	-.5	-.5	-.9	-1.5	-2.7	-9.3	-11.0	-8.0	-4.9	-5.1	-2.6	-.8	-.9	-3.1	-8.6	-12.0	-4.1	-1.6	-3.5	-3.0	-2.8	-3.7	-5.0	-6.7	-11.8	-8.2	-10.0	-10.7	-10.7	-7.0	-5.1
-4.2	-4.9	-3.4	-3.4	-3.4	-2.6	-1.2	-1.7	-1.0	-1.9	-5.3	-11.4	-11.3	-7.0	-3.2	-1.0	-.3	-.1	-.2	-5.6	-5.7	-6.0	-5.8	-2.7	-2.3	-2.8	-1.6	-1.6	-1.4	-2.2	-5.8	-7.2	-5.0	-1.8	-2.6	-5.3
-3.5	-4.5	-4.7	-4.5	-2.9	-3.0	-2.6	-2.2	-.9	-1.2	-.7	-1.9	-4.8	-6.3	-5.9	-4.5	-2.4	-.6	-.2	-1.4	-3.4	-1.3	-3.7	-2.5	-1.7	-2.9	-1.4	-.5	-.6	.1	-2.2	-2.3	-2.2	-1.4	-1.9	-1.7
-2.7	-4.2	-6.0	-7.7	-5.8	-5.4	-5.8	-4.4	-1.7	-.7	-.4	-2.0	-2.8	-4.1	-4.8	-4.7	-3.1	-2.0	-1.1	-1.1	-1.5	-2.5	-3.2	-3.0	-2.2	-2.6	-2.8	-1.9	-1.5	-.8	-1.2	-1.3	-2.4	-4.3	-3.6	-2.3
-3.4	-3.3	-4.2	-4.8	-4.7	-4.2	-3.8	-4.8	-4.3	-2.6	-1.4	-1.6	-2.9	-4.5	-4.0	-3.9	-3.2	-2.6	-2.2	-2.5	-2.7	-2.9	-3.0	-2.8	-2.7	-2.7	-3.2	-3.1	-2.6	-2.4	-2.6	-2.1	-1.8	-2.8	-3.7	-3.7
-3.1	-2.2	-2.0	-2.4	-2.7	-3.3	-3.1	-3.2	-3.6	-3.9	-4.0	-4.0	-3.7	-3.7	-3.5	-3.0	-3.5	-3.5	-3.1	-2.5	-2.6	-2.8	-2.8	-2.8	-2.8	-3.2	-3.2	-3.5	-3.3	-3.0	-2.8	-3.4	-2.5	-2.7	-2.2	-2.7
-2.9	-2.6	-2.7	-2.5	-2.7	-2.5	-2.5	-2.5	-2.5	-3.0	-2.9	-3.5	-2.8	-2.2	-2.0	-2.2	-2.4	-2.5	-2.5	-2.2	-2.5	-2.9	-2.9	-1.7	-1.7	-2.0	-2.0	-1.9	-1.9	-2.1	-2.2	-2.2	-2.6	-2.5	-2.9	-3.1
-2.0	-1.9	-1.5	-1.2	-1.1	-1.2	-1.8	-2.0	-1.8	-1.8	-1.9	-2.0	-2.2	-2.0	-1.9	-1.2	-.5	.3	.5	.5	.3	.4	.6	.6	.4	.3	.4	.4	.4	.5	.7	.8	.8	.7	.7	-1.9
-.7	-.6	-.4	.2	.1	.1	.0	.3	.4	.0	-.4	-.7	-.8	-.7	-.1	.4	.7	.9	.8	.9	.9	.8	.7	.5	.5	.5	.5	.5	.6	.7	.7	.8	.8	.7	-.5	-.7

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

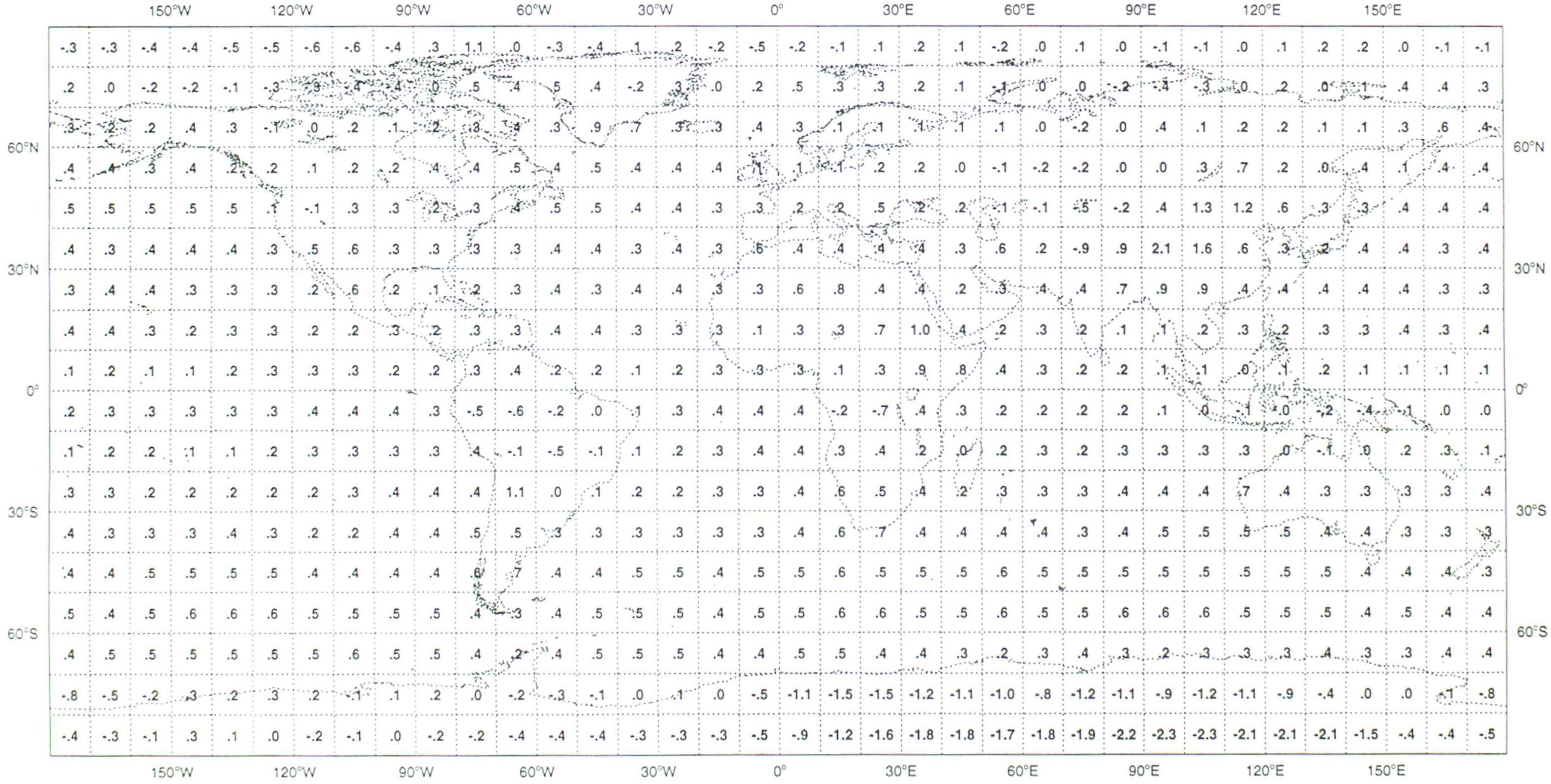

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.3 -.3 -.4 -.4 -.5 -.5 -.6 -.6 -.4 .3 1.1 .0 -.3 -.4 .1 .2 -.2 -.5 -.2 -.1 .1 .2 .1 -.2 .0 .1 .0 -.1 -.1 .0 .1 .2 .2 .0 -.1 -.1
.2 .0 -.2 -.2 -.1 -.3 .3 .4 .4 .0 .5 .4 .5 .4 -.2 .3 .0 .2 .5 .3 .3 .2 .1 -.1 .0 .0 -.2 -.4 -.3 .0 .2 .0 .1 .4 .4 .3
.3 .2 .2 .4 .3 -.1 .0 .2 .1 .2 .3 .4 .3 .9 .7 .3 .3 .4 .3 .1 .1 .1 .1 .1 .0 -.2 .0 .4 .1 .2 .2 .1 .1 .3 .6 .4
.4 .4 .3 .4 .2 .2 .1 .2 .2 .4 .4 .5 .4 .5 .4 .4 .4 .1 .1 .1 .2 .2 .0 -.1 -.2 -.2 .0 .0 .3 .7 .2 .0 .4 .1 .4 .4
.5 .5 .5 .5 .5 .1 -.1 .3 .3 .2 .3 .4 .5 .5 .4 .4 .3 .3 .2 .2 .5 .2 .2 -.1 -.1 -.5 -.2 .4 1.3 1.2 .6 .3 .3 .4 .4 .4
.4 .3 .4 .4 .4 .3 .5 .6 .3 .3 .3 .3 .4 .4 .3 .4 .3 .6 .4 .4 .4 .4 .3 .6 .2 -.9 .9 2.1 1.6 .6 .3 .2 .4 .4 .3 .4
.3 .4 .4 .3 .3 .3 .2 .6 .2 .1 .2 .3 .4 .3 .4 .4 .3 .3 .6 .8 .4 .4 .2 .3 .4 .4 .7 .9 .9 .4 .4 .4 .4 .4 .3 .3
.4 .4 .3 .2 .3 .3 .2 .2 .3 .2 .3 .3 .4 .4 .3 .3 .3 .1 .3 .3 .7 1.0 .4 .2 .3 .2 .1 .1 .2 .3 .2 .3 .3 .4 .3 .4
.1 .2 .1 .1 .2 .3 .3 .3 .2 .2 .3 .4 .2 .2 .1 .2 .3 .3 .3 .1 .3 .9 .8 .4 .3 .2 .2 .1 .1 .0 .1 .2 .1 .1 .1 .1
.2 .3 .3 .3 .3 .3 .4 .4 .4 .3 -.5 -.6 -.2 .0 .1 .3 .4 .4 .4 -.2 -.7 .4 .3 .2 .2 .2 .2 .1 .0 -.1 .0 -.2 -.4 -.1 .0 .0
.1 .2 .2 .1 .1 .2 .3 .3 .3 .3 .4 -.1 -.5 -.1 .1 .2 .3 .4 .4 .3 .4 .2 .0 .2 .3 .2 .3 .3 .3 .3 .0 -.1 .0 .2 .3 .1
.3 .3 .2 .2 .2 .2 .2 .3 .4 .4 .4 1.1 .0 .1 .2 .2 .3 .3 .4 .6 .5 .4 .2 .3 .3 .3 .4 .4 .4 .7 .4 .3 .3 .3 .3 .4
.4 .3 .3 .3 .4 .3 .2 .2 .4 .4 .5 .5 .3 .3 .3 .3 .3 .3 .4 .6 .7 .4 .4 .4 .4 .3 .4 .5 .5 .5 .5 .4 .4 .3 .3 .3
.4 .4 .5 .5 .5 .5 .4 .4 .4 .4 .6 .7 .4 .4 .5 .5 .4 .5 .5 .6 .5 .5 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .3
.5 .4 .5 .6 .6 .6 .5 .5 .5 .5 .4 .3 .4 .5 .5 .5 .4 .5 .5 .6 .6 .5 .5 .6 .5 .5 .6 .6 .6 .5 .5 .5 .4 .5 .4 .4
.4 .5 .5 .5 .5 .5 .5 .6 .5 .5 .4 .2 .4 .5 .5 .5 .4 .4 .5 .5 .4 .4 .3 .2 .3 .4 .3 .2 .3 .3 .3 .4 .3 .3 .4 .4
-.8 -.5 -.2 .3 .2 .3 .2 -.1 .1 .2 .0 -.2 -.3 -.1 .0 .1 .0 -.5 -1.1 -1.5 -1.5 -1.2 -1.1 -1.0 -.8 -1.2 -1.1 -.9 -1.2 -1.1 -.9 -.4 .0 .0 -.1 -.8
-.4 -.3 -.1 .3 .1 .0 -.2 -.1 .0 -.2 -.2 -.4 -.4 -.4 -.3 -.3 -.3 -.5 -.9 -1.2 -1.6 -1.8 -1.8 -1.7 -1.8 -1.9 -2.2 -2.3 -2.3 -2.1 -2.1 -2.1 -1.5 -.4 -.4 -.5

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

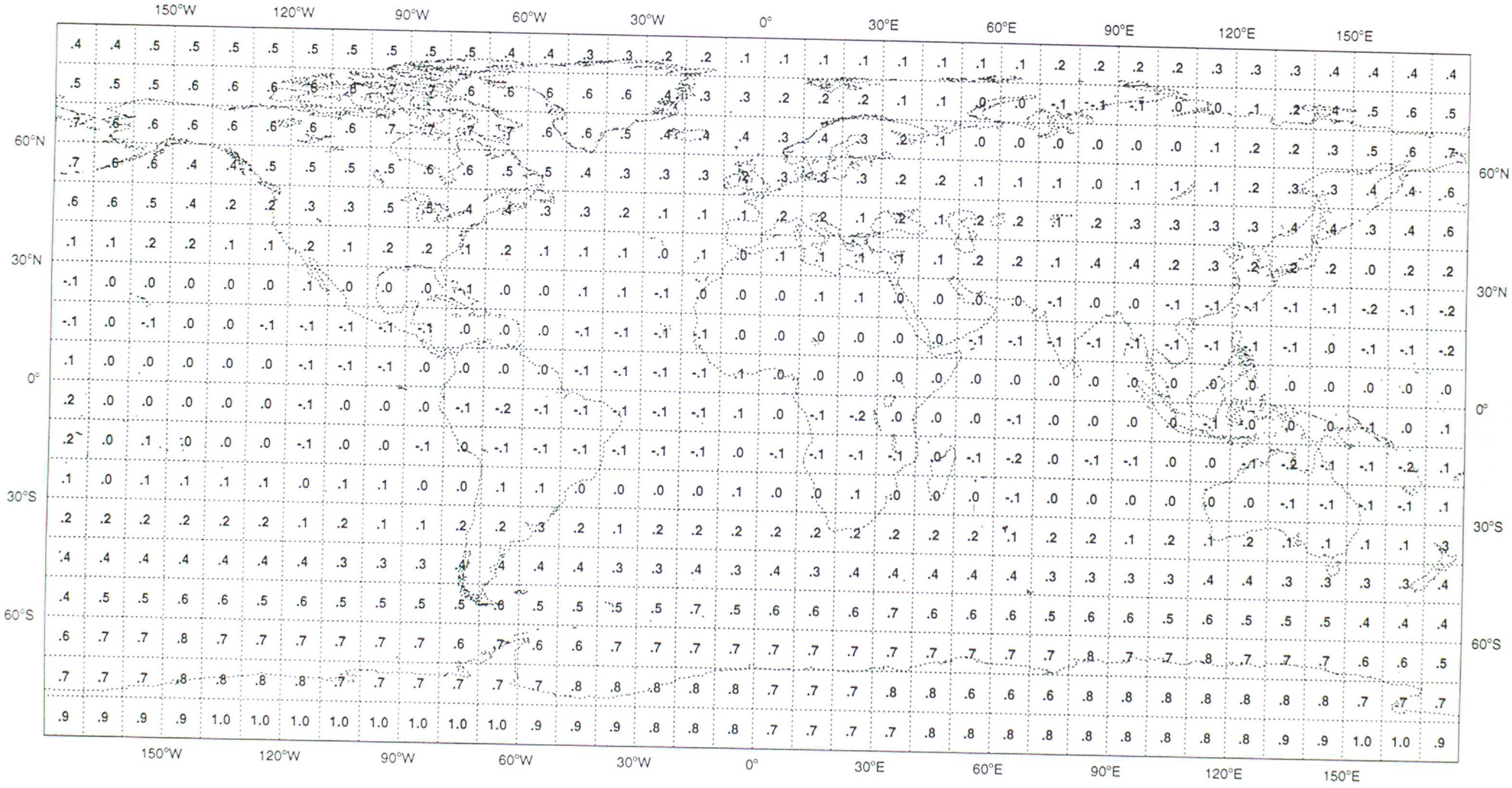

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .3 .3 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .2 .3 .3 .3 .4 .4 .4 .4
.5 .5 .5 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .4 .3 .3 .2 .2 .2 .1 .1 .0 .0 -.1 -.1 -.1 .0 .0 .1 .2 .4 .5 .6 .5
.7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .6 .6 .5 .4 .4 .4 .3 .4 .3 .2 .1 .0 .0 .0 .0 .0 .0 .1 .2 .2 .3 .5 .6 .7
.7 .6 .6 .4 .4 .5 .5 .5 .5 .6 .6 .5 .5 .4 .3 .3 .3 .2 .3 .3 .3 .2 .2 .1 .1 .1 .0 .1 .1 .1 .2 .3 .3 .4 .4 .6
.6 .6 .5 .4 .2 .2 .3 .3 .5 .5 .4 .4 .3 .3 .2 .1 .1 .1 .2 .2 .1 .2 .1 .2 .2 .1 .2 .3 .3 .3 .3 .4 .4 .3 .4 .6
.1 .1 .2 .2 .1 .1 .2 .1 .2 .2 .1 .2 .1 .1 .1 .0 .1 .0 .1 .1 .1 .1 .1 .2 .2 .1 .4 .4 .2 .3 .2 .2 .2 .0 .2 .2
-.1 .0 .0 .0 .0 .0 .1 .0 .0 .0 -.1 .0 .0 .1 .1 -.1 .0 .0 .0 .1 .1 .0 .0 .0 .0 -.1 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.2
-.1 .0 -.1 .0 .0 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 -.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.2
.1 .0 .0 .0 .0 .0 -.1 -.1 -.1 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0
.2 .0 .0 .0 .0 .0 -.1 .0 .0 .0 -.1 -.2 -.1 -.1 -.1 -.1 -.1 .1 .0 -.1 -.2 .0 .0 .0 -.1 .0 .0 .0 .0 -.1 .0 .0 .0 -.1 .0 .1
.2 .0 .1 .0 .0 .0 -.1 .0 .0 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.1 .0 -.1 -.2 .0 -.1 -.1 .0 .0 -.1 -.2 -.1 -.1 -.2 .1
.1 .0 .1 .1 .1 .1 .0 .1 .1 .0 .0 .1 .1 .0 .0 .0 .0 .1 .0 .0 .1 .0 .0 .0 -.1 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .1
.2 .2 .2 .2 .2 .2 .1 .2 .1 .1 .2 .2 .3 .2 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .1 .2 .1 .2 .1 .1 .1 .1 .3
.4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .4 .3 .4 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .4
.4 .5 .5 .6 .6 .5 .6 .5 .5 .5 .5 .6 .5 .5 .5 .5 .7 .5 .6 .6 .6 .7 .6 .6 .6 .5 .6 .6 .5 .6 .5 .5 .5 .4 .4 .4
.6 .7 .7 .8 .7 .7 .7 .7 .7 .7 .6 .7 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .7 .7 .8 .7 .7 .7 .6 .6 .5
.7 .7 .7 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .7 .7 .7 .8 .8 .6 .6 .6 .8 .8 .8 .8 .8 .8 .8 .7 .7 .7
.9 .9 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 .9 .9 .8 .8 .8 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .8 .8 .8 .9 .9 1.0 1.0 .9

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

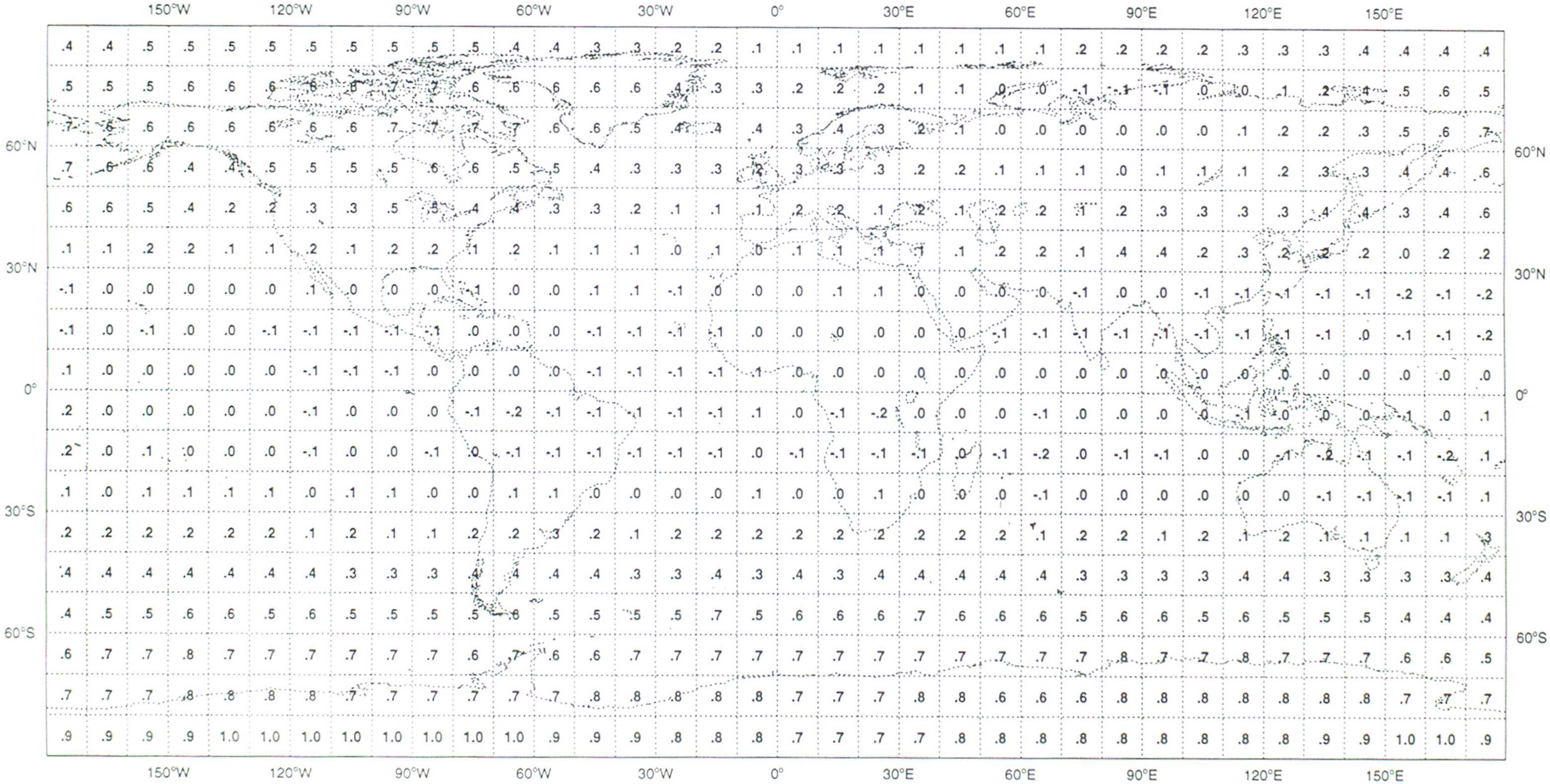
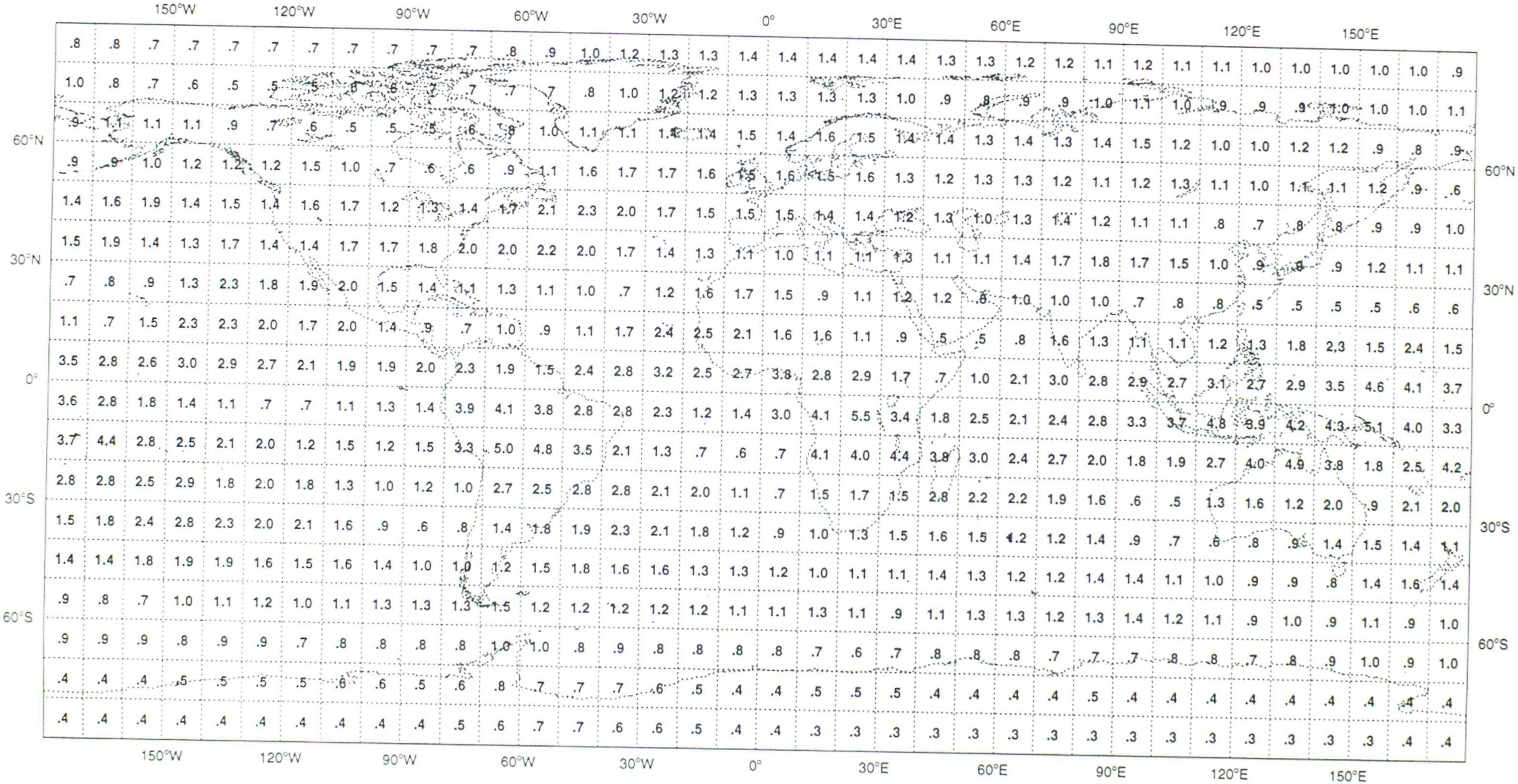
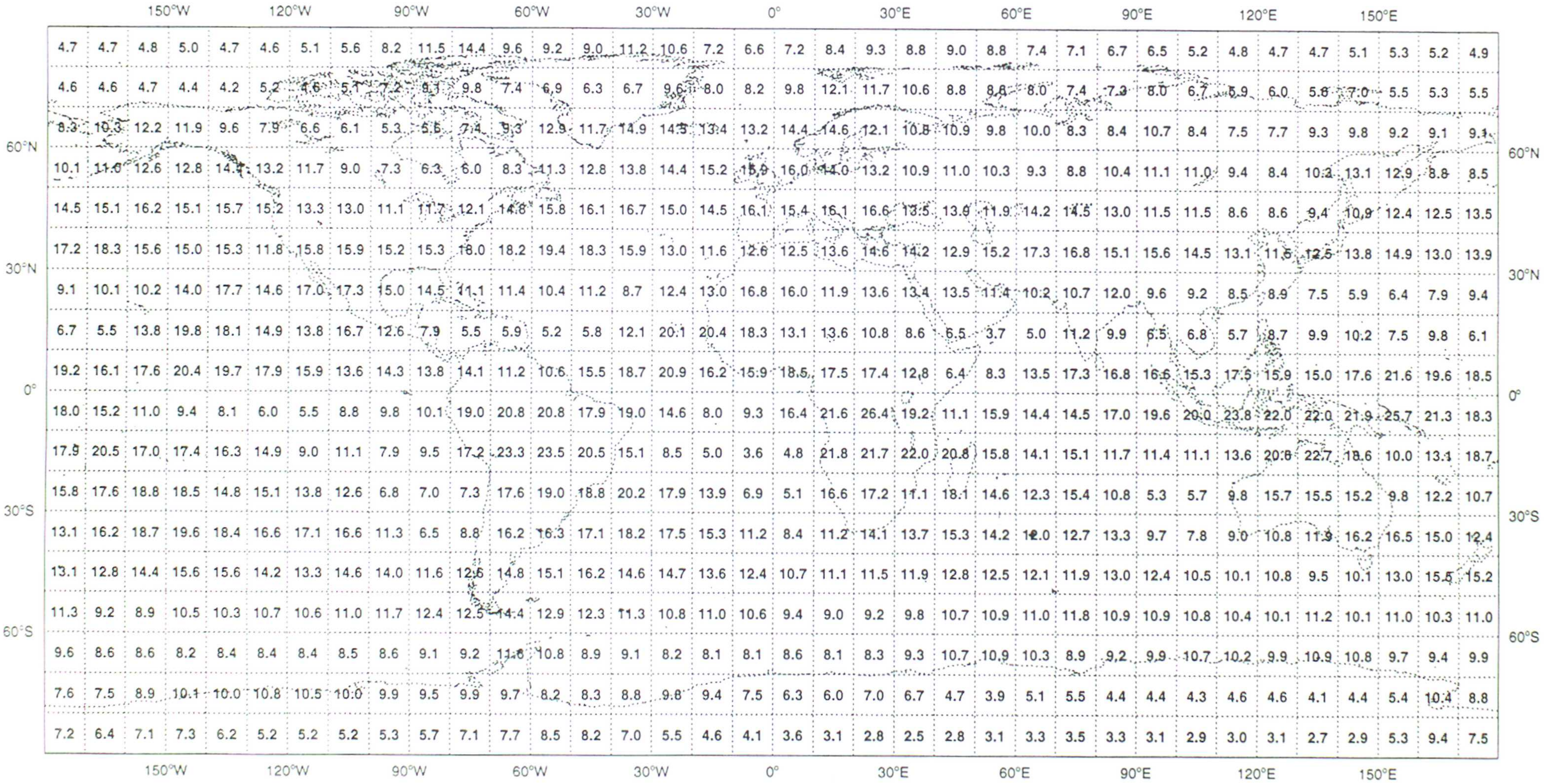

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .3 .3 .2 .2 .1 .1 .1 .1 .1 .1 .1 .1 .2 .2 .2 .2 .3 .3 .3 .4 .4 .4 .4
.5 .5 .5 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .4 .3 .3 .2 .2 .2 .1 .1 .0 .0 -.1 -.1 -.1 .0 .0 .1 .2 .4 .5 .6 .5
.7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .6 .6 .5 .4 .4 .4 .3 .4 .3 .2 .1 .0 .0 .0 .0 .0 .0 .1 .2 .2 .3 .5 .6 .7
.7 .6 .6 .4 .4 .5 .5 .5 .5 .6 .6 .5 .5 .4 .3 .3 .3 .2 .3 .3 .3 .2 .2 .1 .1 .1 .0 .1 .1 .1 .2 .3 .3 .4 .4 .6
.6 .6 .5 .4 .2 .2 .3 .3 .5 .5 .4 .4 .3 .3 .2 .1 .1 .1 .2 .2 .1 .2 .1 .2 .2 .1 .2 .3 .3 .3 .3 .4 .4 .3 .4 .6
.1 .1 .2 .2 .1 .1 .2 .1 .2 .2 .1 .2 .1 .1 .1 .0 .1 .0 .1 .1 .1 .1 .1 .2 .2 .1 .4 .4 .2 .3 .2 .2 .2 .0 .2 .2
-.1 .0 .0 .0 .0 .0 .1 .0 .0 .0 -.1 .0 .0 .1 .1 -.1 .0 .0 .0 .1 .1 .0 .0 .0 .0 -.1 .0 .0 -.1 -.1 -.1 -.1 -.1 -.2 -.1 -.2
-.1 .0 -.1 .0 .0 -.1 -.1 -.1 -.1 -.1 .0 .0 .0 -.1 -.1 -.1 -.1 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.2
.1 .0 .0 .0 .0 .0 -.1 -.1 -.1 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .1 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0 .0
.2 .0 .0 .0 .0 .0 -.1 .0 .0 .0 -.1 -.2 -.1 -.1 -.1 -.1 -.1 .1 .0 -.1 -.2 .0 .0 .0 -.1 .0 .0 .0 .0 -.1 .0 .0 .0 -.1 .0 .1
.2 .0 .1 .0 .0 .0 -.1 .0 .0 -.1 .0 -.1 -.1 -.1 -.1 -.1 -.1 .0 -.1 -.1 -.1 -.1 .0 -.1 -.2 .0 -.1 -.1 .0 .0 -.1 -.2 -.1 -.1 -.2 .1
.1 .0 .1 .1 .1 .1 .0 .1 .1 .0 .0 .1 .1 .0 .0 .0 .0 .1 .0 .0 .1 .0 .0 .0 -.1 .0 .0 .0 .0 .0 .0 -.1 -.1 -.1 -.1 .1
.2 .2 .2 .2 .2 .2 .1 .2 .1 .1 .2 .2 .3 .2 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .1 .2 .1 .2 .1 .1 .1 .1 .3
.4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .3 .3 .4 .3 .4 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .4
.4 .5 .5 .6 .6 .5 .6 .5 .5 .5 .5 .6 .5 .5 .5 .5 .7 .5 .6 .6 .6 .7 .6 .6 .6 .5 .6 .6 .5 .6 .5 .5 .5 .4 .4 .4
.6 .7 .7 .8 .7 .7 .7 .7 .7 .7 .6 .7 .6 .6 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .7 .7 .8 .7 .7 .7 .6 .6 .5
.7 .7 .7 .8 .8 .8 .8 .7 .7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .7 .7 .7 .8 .8 .6 .6 .6 .8 .8 .8 .8 .8 .8 .8 .7 .7 .7
.9 .9 .9 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 .9 .9 .8 .8 .8 .7 .7 .7 .7 .8 .8 .8 .8 .8 .8 .8 .8 .8 .9 .9 1.0 1.0 .9

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



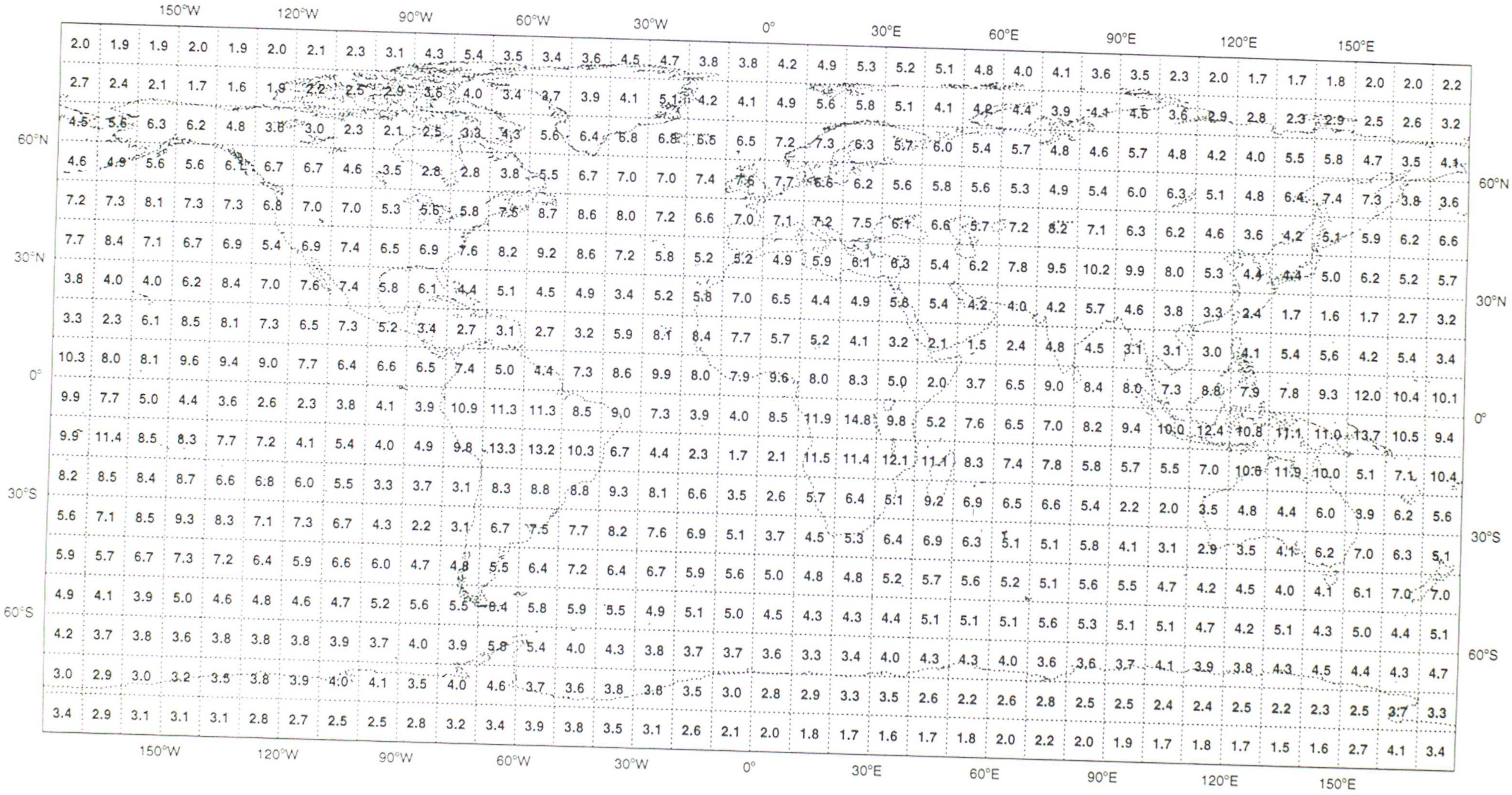
.8	.8	.7	.7	.7	.7	.7	.7	.7	.7	.7	.8	.9	1.0	1.2	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.1	1.2	1.1	1.1	1.0	1.0	1.0	1.0	1.0	.9
1.0	.8	.7	.6	.5	.5	.5	.6	.6	.7	.7	.7	.7	.8	1.0	1.2	1.2	1.3	1.3	1.3	1.3	1.0	.9	.8	.9	.9	1.0	1.1	1.0	.9	.9	.9	1.0	1.0	1.0	1.1
.9	1.1	1.1	1.1	.9	.7	.6	.5	.5	.5	.6	.8	1.0	1.1	1.1	1.4	1.4	1.5	1.4	1.6	1.5	1.4	1.4	1.3	1.4	1.3	1.4	1.5	1.2	1.0	1.0	1.2	1.2	.9	.8	.9
.9	.9	1.0	1.2	1.2	1.2	1.5	1.0	.7	.6	.6	.9	1.1	1.6	1.7	1.7	1.6	1.5	1.6	1.5	1.6	1.3	1.2	1.3	1.3	1.2	1.1	1.2	1.3	1.1	1.0	1.1	1.1	1.2	.9	.6
1.4	1.6	1.9	1.4	1.5	1.4	1.6	1.7	1.2	1.3	1.4	1.7	2.1	2.3	2.0	1.7	1.5	1.5	1.5	1.4	1.4	1.2	1.3	1.0	1.3	1.4	1.2	1.1	1.1	.8	.7	.8	.8	.9	.9	1.0
1.5	1.9	1.4	1.3	1.7	1.4	1.4	1.7	1.7	1.8	2.0	2.0	2.2	2.0	1.7	1.4	1.3	1.1	1.0	1.1	1.1	1.3	1.1	1.1	1.4	1.7	1.8	1.7	1.5	1.0	.9	.8	.9	1.2	1.1	1.1
.7	.8	.9	1.3	2.3	1.8	1.9	2.0	1.5	1.4	1.1	1.3	1.1	1.0	.7	1.2	1.6	1.7	1.5	.9	1.1	1.2	1.2	.8	1.0	1.0	1.0	.7	.8	.8	.5	.5	.5	.5	.6	.6
1.1	.7	1.5	2.3	2.3	2.0	1.7	2.0	1.4	.9	.7	1.0	.9	1.1	1.7	2.4	2.5	2.1	1.6	1.6	1.1	.9	.5	.5	.8	1.6	1.3	1.1	1.1	1.2	1.3	1.8	2.3	1.5	2.4	1.5
3.5	2.8	2.6	3.0	2.9	2.7	2.1	1.9	1.9	2.0	2.3	1.9	1.5	2.4	2.8	3.2	2.5	2.7	3.8	2.8	2.9	1.7	.7	1.0	2.1	3.0	2.8	2.9	2.7	3.1	2.7	2.9	3.5	4.6	4.1	3.7
3.6	2.8	1.8	1.4	1.1	.7	.7	1.1	1.3	1.4	3.9	4.1	3.8	2.8	2.8	2.3	1.2	1.4	3.0	4.1	5.5	3.4	1.8	2.5	2.1	2.4	2.8	3.3	3.7	4.8	3.9	4.2	4.3	5.1	4.0	3.3
3.7	4.4	2.8	2.5	2.1	2.0	1.2	1.5	1.2	1.5	3.3	5.0	4.8	3.5	2.1	1.3	.7	.6	.7	4.1	4.0	4.4	3.8	3.0	2.4	2.7	2.0	1.8	1.9	2.7	4.0	4.9	3.8	1.8	2.5	4.2
2.8	2.8	2.5	2.9	1.8	2.0	1.8	1.3	1.0	1.2	1.0	2.7	2.5	2.8	2.8	2.1	2.0	1.1	.7	1.5	1.7	1.5	2.8	2.2	2.2	1.9	1.6	.6	.5	1.3	1.6	1.2	2.0	.9	2.1	2.0
1.5	1.8	2.4	2.8	2.3	2.0	2.1	1.6	.9	.6	.8	1.4	1.8	1.9	2.3	2.1	1.8	1.2	.9	1.0	1.3	1.5	1.6	1.5	1.2	1.2	1.4	.9	.7	.6	.8	.9	1.4	1.5	1.4	1.1
1.4	1.4	1.8	1.9	1.9	1.6	1.5	1.6	1.4	1.0	1.0	1.2	1.5	1.8	1.6	1.6	1.3	1.3	1.2	1.0	1.1	1.1	1.4	1.3	1.2	1.2	1.4	1.4	1.1	1.0	.9	.9	.8	1.4	1.6	1.4
.9	.8	.7	1.0	1.1	1.2	1.0	1.1	1.3	1.3	1.3	1.5	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.3	1.1	.9	1.1	1.3	1.3	1.2	1.3	1.4	1.2	1.1	.9	1.0	.9	1.1	.9	1.0
.9	.9	.9	.8	.9	.9	.7	.8	.8	.8	.8	1.0	1.0	.8	.9	.8	.8	.8	.8	.7	.6	.7	.8	.8	.8	.7	.7	.7	.8	.8	.7	.8	.9	1.0	.9	1.0
.4	.4	.4	.5	.5	.5	.5	.6	.6	.5	.6	.8	.7	.7	.7	.6	.5	.4	.4	.5	.5	.5	.4	.4	.4	.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4
.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.6	.7	.7	.6	.6	.5	.4	.4	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.4	.4

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



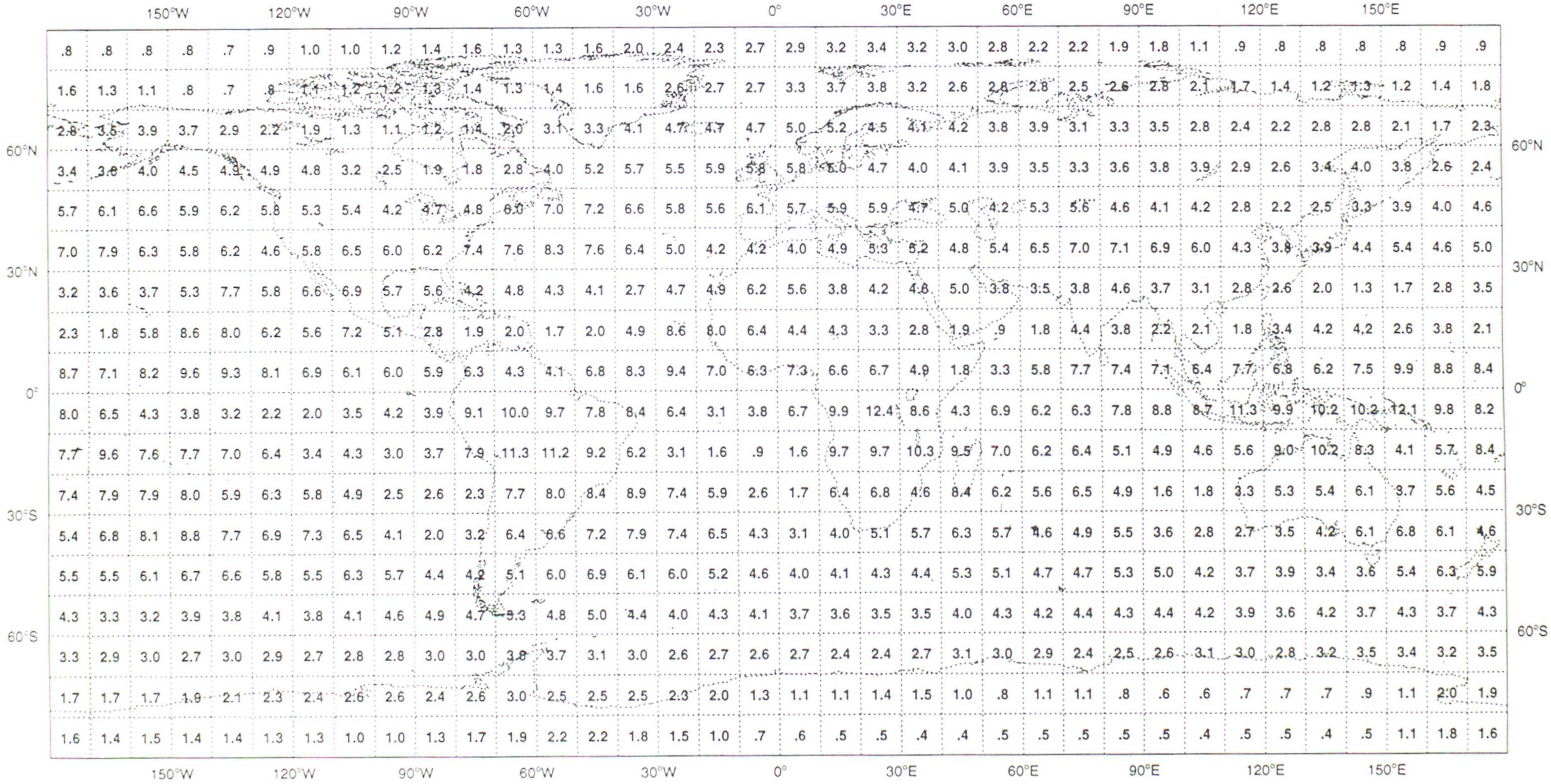
4.7	4.7	4.8	5.0	4.7	4.6	5.1	5.6	8.2	11.5	14.4	9.6	9.2	9.0	11.2	10.6	7.2	6.6	7.2	8.4	9.3	8.8	9.0	8.8	7.4	7.1	6.7	6.5	5.2	4.8	4.7	4.7	5.1	5.3	5.2	4.9
4.6	4.6	4.7	4.4	4.2	5.2	4.6	5.1	7.2	9.1	9.8	7.4	6.9	6.3	6.7	9.6	8.0	8.2	9.8	12.1	11.7	10.6	8.8	8.8	8.0	7.4	7.3	8.0	6.7	5.9	6.0	5.8	7.0	5.5	5.3	5.5
8.3	10.3	12.2	11.9	9.6	7.9	6.6	6.1	5.3	5.6	7.4	9.3	12.9	11.7	14.9	14.3	13.4	13.2	14.4	14.6	12.1	10.8	10.9	9.8	10.0	8.3	8.4	10.7	8.4	7.5	7.7	9.3	9.8	9.2	9.1	9.1
10.1	11.0	12.6	12.8	14.4	13.2	11.7	9.0	7.3	6.3	6.0	8.3	11.3	12.8	13.8	14.4	15.2	15.9	16.0	14.0	13.2	10.9	11.0	10.3	9.3	8.8	10.4	11.1	11.0	9.4	8.4	10.3	13.1	12.9	8.8	8.5
14.5	15.1	16.2	15.1	15.7	15.2	13.3	13.0	11.1	11.7	12.1	14.8	15.8	16.1	16.7	15.0	14.5	16.1	15.4	16.1	16.6	13.5	13.9	11.9	14.2	14.5	13.0	11.5	11.5	8.6	8.6	9.4	10.9	12.4	12.5	13.5
17.2	18.3	15.6	15.0	15.3	11.8	15.8	15.9	15.2	15.3	18.0	18.2	19.4	18.3	15.9	13.0	11.6	12.6	12.5	13.6	14.6	14.2	12.9	15.2	17.3	16.8	15.1	15.6	14.5	13.1	11.5	12.5	13.8	14.9	13.0	13.9
9.1	10.1	10.2	14.0	17.7	14.6	17.0	17.3	15.0	14.5	11.1	11.4	10.4	11.2	8.7	12.4	13.0	16.8	16.0	11.9	13.6	13.4	13.5	11.4	10.2	10.7	12.0	9.6	9.2	8.5	8.9	7.5	5.9	6.4	7.9	9.4
6.7	5.5	13.8	19.8	18.1	14.9	13.8	16.7	12.6	7.9	5.5	5.9	5.2	5.8	12.1	20.1	20.4	18.3	13.1	13.6	10.8	8.6	6.5	3.7	5.0	11.2	9.9	6.5	6.8	5.7	8.7	9.9	10.2	7.5	9.8	6.1
19.2	16.1	17.6	20.4	19.7	17.9	15.9	13.6	14.3	13.8	14.1	11.2	10.6	15.5	18.7	20.9	16.2	15.9	18.5	17.5	17.4	12.8	6.4	8.3	13.5	17.3	16.8	16.6	15.3	17.5	15.9	15.0	17.6	21.6	19.6	18.5
18.0	15.2	11.0	9.4	8.1	6.0	5.5	8.8	9.8	10.1	19.0	20.8	20.8	17.9	19.0	14.6	8.0	9.3	16.4	21.6	26.4	19.2	11.1	15.9	14.4	14.5	17.0	19.6	20.0	23.8	22.0	22.0	21.9	25.7	21.3	18.3
17.9	20.5	17.0	17.4	16.3	14.9	9.0	11.1	7.9	9.5	17.2	23.3	23.5	20.5	15.1	8.5	5.0	3.6	4.8	21.8	21.7	22.0	20.8	15.8	14.1	15.1	11.7	11.4	11.1	13.6	20.6	22.7	18.6	10.0	13.1	18.7
15.8	17.6	18.8	18.5	14.8	15.1	13.8	12.6	6.8	7.0	7.3	17.6	19.0	18.8	20.2	17.9	13.9	6.9	5.1	16.6	17.2	11.1	18.1	14.6	12.3	15.4	10.8	5.3	5.7	9.8	15.7	15.5	15.2	9.8	12.2	10.7
13.1	16.2	18.7	19.6	18.4	16.6	17.1	16.6	11.3	6.5	8.8	16.2	16.3	17.1	18.2	17.5	15.3	11.2	8.4	11.2	14.1	13.7	15.3	14.2	12.0	12.7	13.3	9.7	7.8	9.0	10.8	11.9	16.2	16.5	15.0	12.4
13.1	12.8	14.4	15.6	15.6	14.2	13.3	14.6	14.0	11.6	12.6	14.8	15.1	16.2	14.6	14.7	13.6	12.4	10.7	11.1	11.5	11.9	12.8	12.5	12.1	11.9	13.0	12.4	10.5	10.1	10.8	9.5	10.1	13.0	15.5	15.2
11.3	9.2	8.9	10.5	10.3	10.7	10.6	11.0	11.7	12.4	12.5	14.4	12.9	12.3	11.3	10.8	11.0	10.6	9.4	9.0	9.2	9.8	10.7	10.9	11.0	11.8	10.9	10.9	10.8	10.4	10.1	11.2	10.1	11.0	10.3	11.0
9.6	8.6	8.6	8.2	8.4	8.4	8.4	8.5	8.6	9.1	9.2	11.6	10.8	8.9	9.1	8.2	8.1	8.1	8.6	8.1	8.3	9.3	10.7	10.9	10.3	8.9	9.2	9.9	10.7	10.2	9.9	10.9	10.8	9.7	9.4	9.9
7.6	7.5	8.9	10.1	10.0	10.8	10.5	10.0	9.9	9.5	9.9	9.7	8.2	8.3	8.8	9.8	9.4	7.5	6.3	6.0	7.0	6.7	4.7	3.9	5.1	5.5	4.4	4.4	4.3	4.6	4.6	4.1	4.4	5.4	10.4	8.8
7.2	6.4	7.1	7.3	6.2	5.2	5.2	5.2	5.3	5.7	7.1	7.7	8.5	8.2	7.0	5.5	4.6	4.1	3.6	3.1	2.8	2.5	2.8	3.1	3.3	3.5	3.3	3.1	2.9	3.0	3.1	2.7	2.9	5.3	9.4	7.5

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



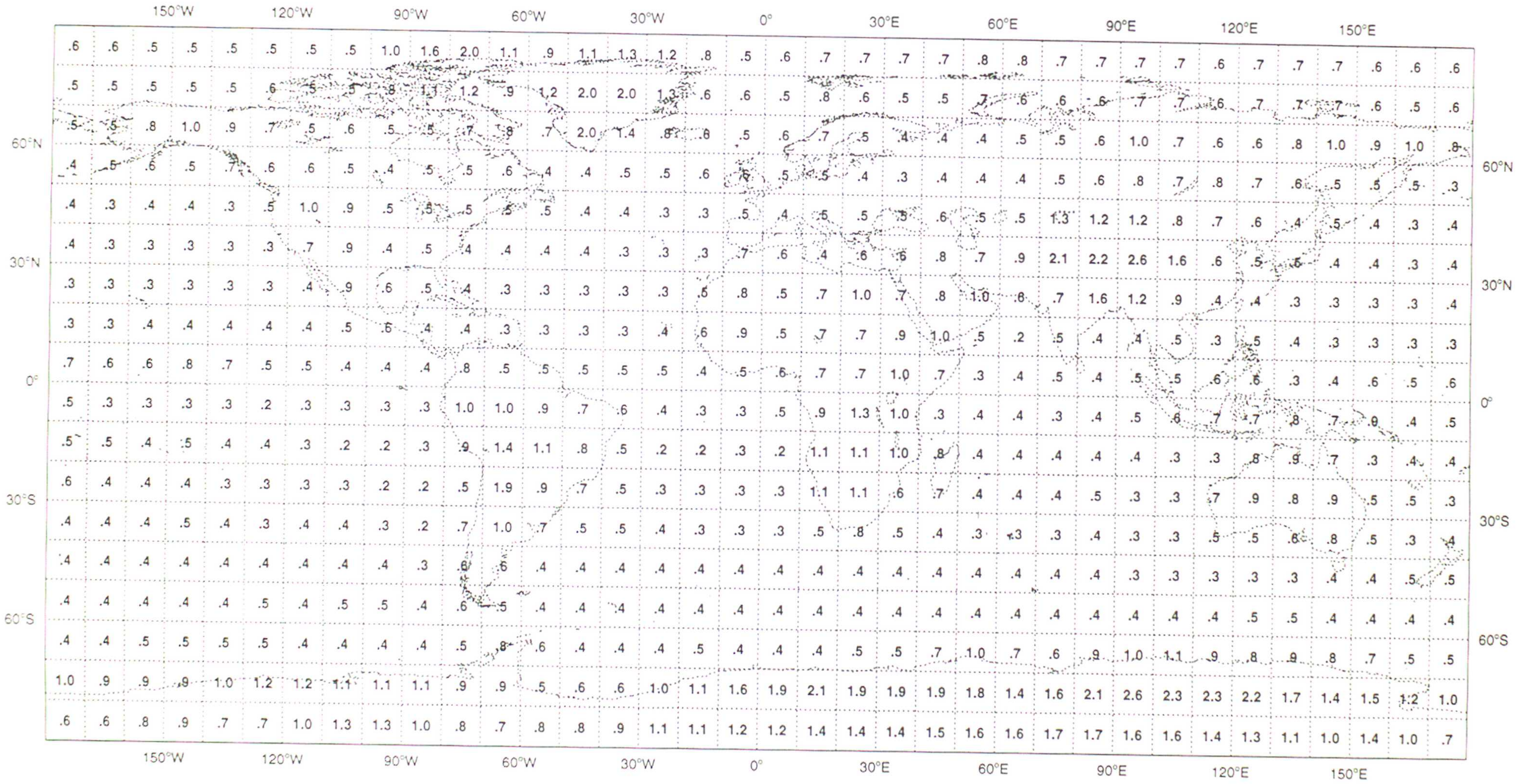
2.0	1.9	1.9	2.0	1.9	2.0	2.1	2.3	3.1	4.3	5.4	3.5	3.4	3.6	4.5	4.7	3.8	3.8	4.2	4.9	5.3	5.2	5.1	4.8	4.0	4.1	3.6	3.5	2.3	2.0	1.7	1.7	1.8	2.0	2.0	2.2
2.7	2.4	2.1	1.7	1.6	1.9	2.2	2.5	2.9	3.5	4.0	3.4	3.7	3.9	4.1	5.1	4.2	4.1	4.9	5.6	5.8	5.1	4.1	4.2	4.4	3.9	4.1	4.6	3.6	2.9	2.8	2.3	2.9	2.5	2.6	3.2
4.5	5.6	6.3	6.2	4.8	3.8	3.0	2.3	2.1	2.5	3.3	4.3	5.6	6.4	5.8	6.8	5.5	6.5	7.2	7.3	6.3	5.7	6.0	5.4	5.7	4.8	4.6	5.7	4.8	4.2	4.0	5.5	5.8	4.7	3.5	4.1
4.6	4.9	5.6	5.6	6.1	6.7	6.7	4.6	3.5	2.8	2.8	3.8	5.5	6.7	7.0	7.0	7.4	7.6	7.7	6.6	6.2	5.6	5.8	5.6	5.3	4.9	5.4	6.0	6.3	5.1	4.8	6.4	7.4	7.3	3.8	3.6
7.2	7.3	8.1	7.3	7.3	6.8	7.0	7.0	5.3	5.6	5.8	7.5	8.7	8.6	8.0	7.2	6.6	7.0	7.1	7.2	7.5	6.1	6.6	5.7	7.2	8.2	7.1	6.3	6.2	4.6	3.6	4.2	5.1	5.9	6.2	6.6
7.7	8.4	7.1	6.7	6.9	5.4	6.9	7.4	6.5	6.9	7.6	8.2	9.2	8.6	7.2	5.8	5.2	5.2	4.9	5.9	6.1	6.3	5.4	6.2	7.8	9.5	10.2	9.9	8.0	5.3	4.4	4.4	5.0	6.2	5.2	5.7
3.8	4.0	4.0	6.2	8.4	7.0	7.6	7.4	5.8	6.1	4.4	5.1	4.5	4.9	3.4	5.2	5.8	7.0	6.5	4.4	4.9	5.8	5.4	4.2	4.0	4.2	5.7	4.6	3.8	3.3	2.4	1.7	1.6	1.7	2.7	3.2
3.3	2.3	6.1	8.5	8.1	7.3	6.5	7.3	5.2	3.4	2.7	3.1	2.7	3.2	5.9	8.1	8.4	7.7	5.7	5.2	4.1	3.2	2.1	1.5	2.4	4.8	4.5	3.1	3.1	3.0	4.1	5.4	5.6	4.2	5.4	3.4
10.3	8.0	8.1	9.6	9.4	9.0	7.7	6.4	6.6	6.5	7.4	5.0	4.4	7.3	8.6	9.9	8.0	7.9	9.6	8.0	8.3	5.0	2.0	3.7	6.5	9.0	8.4	8.0	7.3	8.8	7.9	7.8	9.3	12.0	10.4	10.1
9.9	7.7	5.0	4.4	3.6	2.6	2.3	3.8	4.1	3.9	10.9	11.3	11.3	8.5	9.0	7.3	3.9	4.0	8.5	11.9	14.8	9.8	5.2	7.6	6.5	7.0	8.2	9.4	10.0	12.4	10.8	11.1	11.0	13.7	10.5	9.4
9.9	11.4	8.5	8.3	7.7	7.2	4.1	5.4	4.0	4.9	9.8	13.3	13.2	10.3	6.7	4.4	2.3	1.7	2.1	11.5	11.4	12.1	11.1	8.3	7.4	7.8	5.8	5.7	5.5	7.0	10.8	11.9	10.0	5.1	7.1	10.4
8.2	8.5	8.4	8.7	6.6	6.8	6.0	5.5	3.3	3.7	3.1	8.3	8.8	8.8	9.3	8.1	6.6	3.5	2.6	5.7	6.4	5.1	9.2	6.9	6.5	6.6	5.4	2.2	2.0	3.5	4.8	4.4	6.0	3.9	6.2	5.6
5.6	7.1	8.5	9.3	8.3	7.1	7.3	6.7	4.3	2.2	3.1	6.7	7.5	7.7	8.2	7.6	6.9	5.1	3.7	4.5	5.3	6.4	6.9	6.3	5.1	5.1	5.8	4.1	3.1	2.9	3.5	4.1	6.2	7.0	6.3	5.1
5.9	5.7	6.7	7.3	7.2	6.4	5.9	6.6	6.0	4.7	4.8	5.5	6.4	7.2	6.4	6.7	5.9	5.6	5.0	4.8	4.8	5.2	5.7	5.6	5.2	5.1	5.6	5.5	4.7	4.2	4.5	4.0	4.1	6.1	7.0	7.0
4.9	4.1	3.9	5.0	4.6	4.8	4.6	4.7	5.2	5.6	5.5	6.4	5.8	5.9	5.5	4.9	5.1	5.0	4.5	4.3	4.3	4.4	5.1	5.1	5.1	5.6	5.3	5.1	5.1	4.7	4.2	5.1	4.3	5.0	4.4	5.1
4.2	3.7	3.8	3.6	3.8	3.8	3.8	3.9	3.7	4.0	3.9	5.8	5.4	4.0	4.3	3.8	3.7	3.7	3.6	3.3	3.4	4.0	4.3	4.3	4.0	3.6	3.6	3.7	4.1	3.9	3.8	4.3	4.5	4.4	4.3	4.7
3.0	2.9	3.0	3.2	3.5	3.8	3.9	4.0	4.1	3.5	4.0	4.6	3.7	3.6	3.8	3.8	3.5	3.0	2.8	2.9	3.3	3.5	2.6	2.2	2.6	2.8	2.5	2.5	2.4	2.4	2.5	2.2	2.3	2.5	3.7	3.3
3.4	2.9	3.1	3.1	3.1	2.8	2.7	2.5	2.5	2.8	3.2	3.4	3.9	3.8	3.5	3.1	2.6	2.1	2.0	1.8	1.7	1.6	1.7	1.8	2.0	2.2	2.0	1.9	1.7	1.8	1.7	1.5	1.6	2.7	4.1	3.4

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



.8	.8	.8	.8	.7	.9	1.0	1.0	1.2	1.4	1.6	1.3	1.3	1.6	2.0	2.4	2.3	2.7	2.9	3.2	3.4	3.2	3.0	2.8	2.2	2.2	1.9	1.8	1.1	.9	.8	.8	.8	.8	.9	.9
1.6	1.3	1.1	.8	.7	.8	1.1	1.2	1.2	1.3	1.4	1.3	1.4	1.6	1.6	2.6	2.7	2.7	3.3	3.7	3.8	3.2	2.6	2.8	2.8	2.5	2.6	2.8	2.1	1.7	1.4	1.2	1.3	1.2	1.4	1.8
2.8	3.5	3.9	3.7	2.9	2.2	1.9	1.3	1.1	1.2	1.4	2.0	3.1	3.3	4.1	4.7	4.7	4.7	5.0	5.2	4.5	4.1	4.2	3.8	3.9	3.1	3.3	3.5	2.8	2.4	2.2	2.8	2.8	2.1	1.7	2.3
3.4	3.8	4.0	4.5	4.9	4.9	4.8	3.2	2.5	1.9	1.8	2.8	4.0	5.2	5.7	5.5	5.9	5.8	5.8	6.0	4.7	4.0	4.1	3.9	3.5	3.3	3.6	3.8	3.9	2.9	2.6	3.4	4.0	3.8	2.6	2.4
5.7	6.1	6.6	5.9	6.2	5.8	5.3	5.4	4.2	4.7	4.8	6.0	7.0	7.2	6.6	5.8	5.6	6.1	5.7	5.9	5.9	4.7	5.0	4.2	5.3	5.6	4.6	4.1	4.2	2.8	2.2	2.5	3.3	3.9	4.0	4.6
7.0	7.9	6.3	5.8	6.2	4.6	5.8	6.5	6.0	6.2	7.4	7.6	8.3	7.6	6.4	5.0	4.2	4.2	4.0	4.9	5.3	5.2	4.8	5.4	6.5	7.0	7.1	6.9	6.0	4.3	3.8	3.9	4.4	5.4	4.6	5.0
3.2	3.6	3.7	5.3	7.7	5.8	6.6	6.9	5.7	5.6	4.2	4.8	4.3	4.1	2.7	4.7	4.9	6.2	5.6	3.8	4.2	4.8	5.0	3.8	3.5	3.8	4.6	3.7	3.1	2.8	2.6	2.0	1.3	1.7	2.8	3.5
2.3	1.8	5.8	8.6	8.0	6.2	5.6	7.2	5.1	2.8	1.9	2.0	1.7	2.0	4.9	8.6	8.0	6.4	4.4	4.3	3.3	2.8	1.9	.9	1.8	4.4	3.8	2.2	2.1	1.8	3.4	4.2	4.2	2.6	3.8	2.1
8.7	7.1	8.2	9.6	9.3	8.1	6.9	6.1	6.0	5.9	6.3	4.3	4.1	6.8	8.3	9.4	7.0	6.3	7.3	6.6	6.7	4.9	1.8	3.3	5.8	7.7	7.4	7.1	6.4	7.7	6.8	6.2	7.5	9.9	8.8	8.4
8.0	6.5	4.3	3.8	3.2	2.2	2.0	3.5	4.2	3.9	9.1	10.0	9.7	7.8	8.4	6.4	3.1	3.8	6.7	9.9	12.4	8.6	4.3	6.9	6.2	6.3	7.8	8.8	8.7	11.3	9.9	10.2	10.2	12.1	9.8	8.2
7.7	9.6	7.6	7.7	7.0	6.4	3.4	4.3	3.0	3.7	7.9	11.3	11.2	9.2	6.2	3.1	1.6	.9	1.6	9.7	9.7	10.3	9.5	7.0	6.2	6.4	5.1	4.9	4.6	5.6	9.0	10.2	8.3	4.1	5.7	8.4
7.4	7.9	7.9	8.0	5.9	6.3	5.8	4.9	2.5	2.6	2.3	7.7	8.0	8.4	8.9	7.4	5.9	2.6	1.7	6.4	6.8	4.6	8.4	6.2	5.6	6.5	4.9	1.6	1.8	3.3	5.3	5.4	6.1	3.7	5.6	4.5
5.4	6.8	8.1	8.8	7.7	6.9	7.3	6.5	4.1	2.0	3.2	6.4	6.6	7.2	7.9	7.4	6.5	4.3	3.1	4.0	5.1	5.7	6.3	5.7	4.6	4.9	5.5	3.6	2.8	2.7	3.5	4.2	6.1	6.8	6.1	4.6
5.5	5.5	6.1	6.7	6.6	5.8	5.5	6.3	5.7	4.4	4.2	5.1	6.0	6.9	6.1	6.0	5.2	4.6	4.0	4.1	4.3	4.4	5.3	5.1	4.7	4.7	5.3	5.0	4.2	3.7	3.9	3.4	3.6	5.4	6.3	5.9
4.3	3.3	3.2	3.9	3.8	4.1	3.8	4.1	4.6	4.9	4.7	5.3	4.8	5.0	4.4	4.0	4.3	4.1	3.7	3.6	3.5	3.5	4.0	4.3	4.2	4.4	4.3	4.4	4.2	3.9	3.6	4.2	3.7	4.3	3.7	4.3
3.3	2.9	3.0	2.7	3.0	2.9	2.7	2.8	2.8	3.0	3.0	3.8	3.7	3.1	3.0	2.6	2.7	2.6	2.7	2.4	2.4	2.7	3.1	3.0	2.9	2.4	2.5	2.6	3.1	3.0	2.8	3.2	3.5	3.4	3.2	3.5
1.7	1.7	1.7	1.9	2.1	2.3	2.4	2.6	2.6	2.4	2.6	3.0	2.5	2.5	2.5	2.3	2.0	1.3	1.1	1.1	1.4	1.5	1.0	.8	1.1	1.1	.8	.6	.6	.7	.7	.7	.9	1.1	2.0	1.9
1.6	1.4	1.5	1.4	1.4	1.3	1.3	1.0	1.0	1.3	1.7	1.9	2.2	2.2	1.8	1.5	1.0	.7	.6	.5	.5	.4	.4	.5	.5	.5	.5	.5	.4	.5	.5	.4	.5	1.1	1.8	1.6

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations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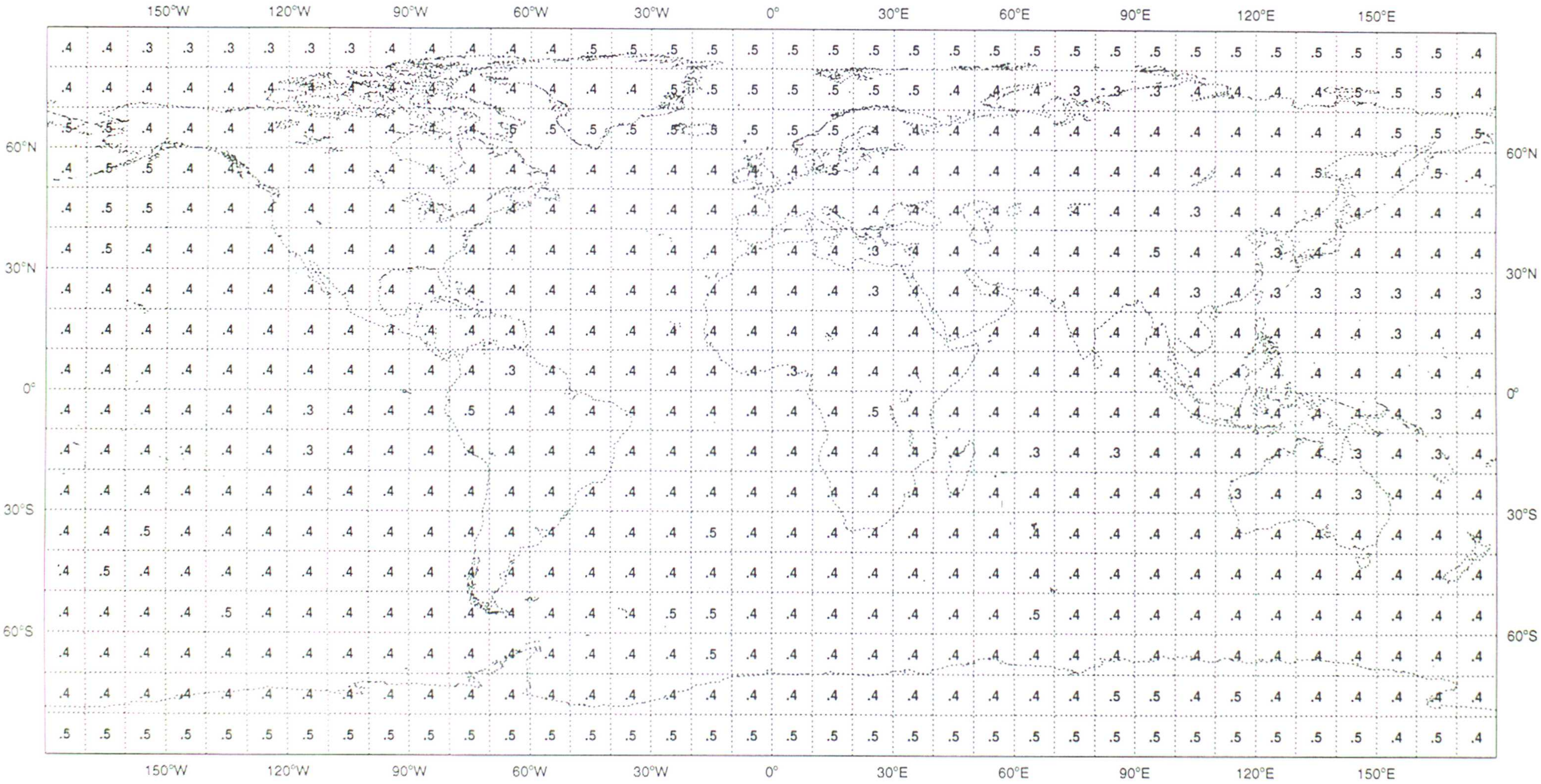
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.4 .4 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4
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.5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5
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Figure 54. ATOVS SD O-B brightness temperature differences (deg C). FEBRUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

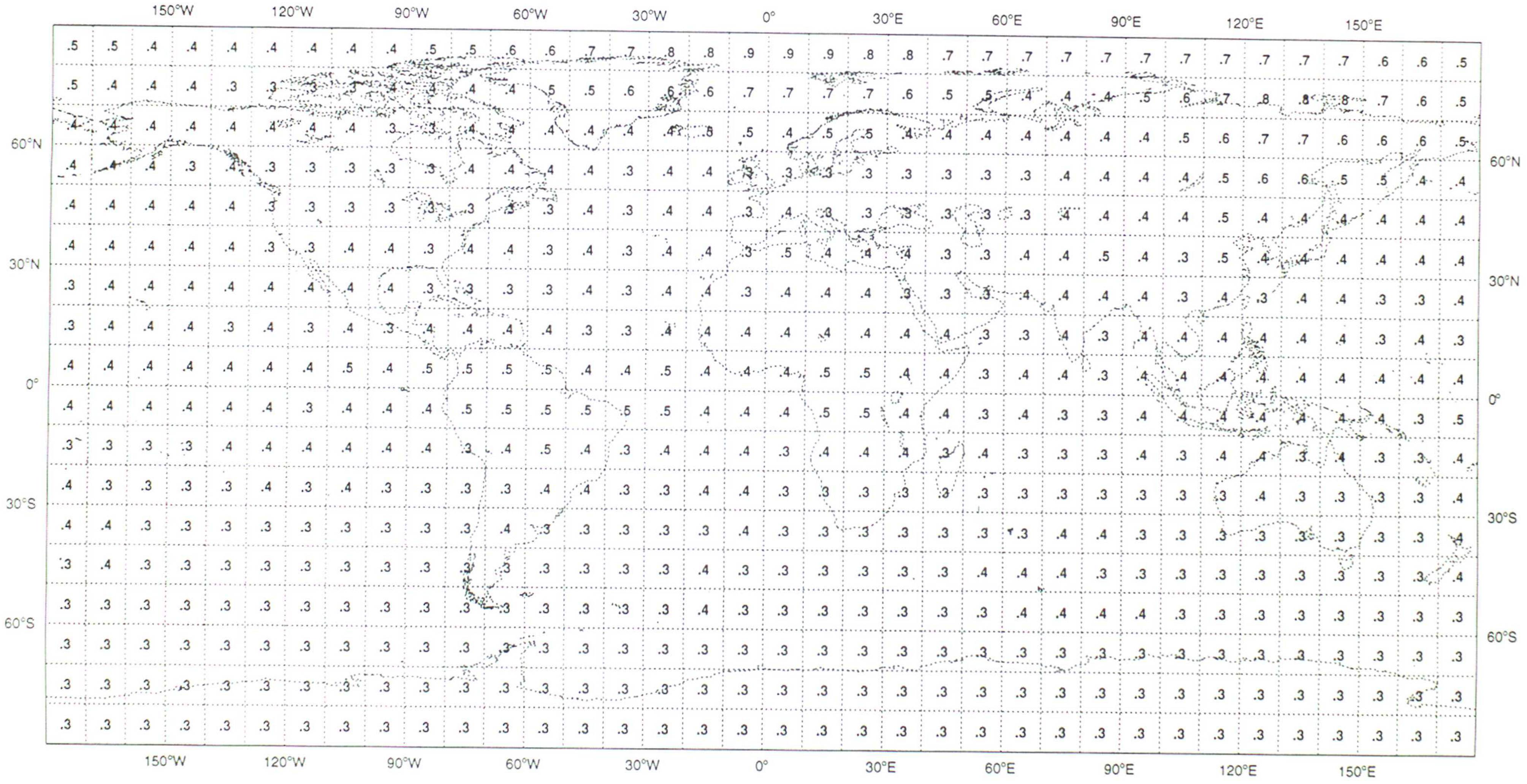
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored
:Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the wind observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
106019	19.7	-83.5	ALL	P	SUR	2	0	0	0.3	-2.0	2.1
12598	59.9	-12.5	ALL	P	SUR	1	0	0	0.0	-8.0	8.0
258015	26.2	-79.1	ALL	P	SUR	1	0	0	0.0	-3.8	3.8
278018	26.0	-78.1	ALL	P	SUR	1	0	0	0.0	-1.3	1.3
41523	30.1	-45.1	ALL	P	SUR	361	0	0	1.0	0.0	1.0
41552	20.6	-50.2	ALL	P	SUR	584	1	0	0.5	-1.1	1.2
41553	21.8	-68.9	ALL	P	SUR	492	0	0	0.5	-0.4	0.6
41554	22.2	-69.6	ALL	P	SUR	582	0	0	0.5	-0.7	0.9
41556	14.7	-67.6	ALL	P	SUR	565	0	0	0.5	-0.7	0.8
41557	20.2	-64.0	ALL	P	SUR	579	0	0	0.5	-0.5	0.7
41559	19.9	-62.2	ALL	P	SUR	572	0	0	0.5	-0.7	0.8
41560	17.7	-56.3	ALL	P	SUR	567	0	0	0.5	-0.7	0.8
41561	20.5	-54.6	ALL	P	SUR	549	0	0	0.5	-0.8	0.9
41563	18.8	-45.6	ALL	P	SUR	574	0	0	0.5	-0.6	0.8
41645	30.5	-77.9	ALL	P	SUR	595	0	0	0.7	0.5	0.9
41647	25.0	-73.5	ALL	P	SUR	555	0	0	0.6	-0.1	0.6
41648	27.8	-73.2	ALL	P	SUR	583	0	0	0.7	0.3	0.7
41650	25.6	-71.3	ALL	P	SUR	630	0	0	0.5	0.4	0.7
41651	24.3	-75.4	ALL	P	SUR	582	0	0	0.6	0.2	0.6
41652	28.5	-63.4	ALL	P	SUR	561	0	0	0.6	-0.2	0.6
41656	32.1	-80.0	ALL	P	SUR	606	0	0	0.9	0.2	0.9
41657	39.7	-53.0	ALL	P	SUR	512	3	1	1.6	0.3	1.7
41658	41.3	-43.1	ALL	P	SUR	623	1	0	1.6	-0.4	1.6
41659	38.1	-51.9	ALL	P	SUR	609	0	0	0.9	0.9	1.3
44513	38.2	-70.2	ALL	P	SUR	353	134	38	7.0	-4.6	8.4
44514	37.9	-69.8	ALL	P	SUR	590	14	2	3.5	0.3	3.5
44515	38.8	-65.4	ALL	P	SUR	361	121	34	7.2	-3.2	7.8
44516	38.0	-72.8	ALL	P	SUR	348	123	35	6.0	-3.0	6.7
44517	40.2	-69.1	ALL	P	SUR	403	207	51	5.9	-6.2	8.5
44546	62.8	-8.0	ALL	P	SUR	1019	0	0	1.1	-0.6	1.3
44548	57.2	-6.8	ALL	P	SUR	151	0	0	1.2	-0.7	1.4
44549	53.1	-26.0	ALL	P	SUR	938	2	0	1.7	0.8	1.9
44550	50.6	-30.4	ALL	P	SUR	956	2	0	1.4	0.1	1.4
44612	27.3	-29.8	ALL	P	SUR	645	0	0	0.5	-0.4	0.7
44616	47.0	-24.0	ALL	P	SUR	1059	0	0	0.8	-0.2	0.9
44621	60.7	-36.0	ALL	P	SUR	1264	0	0	1.7	0.6	1.8
44623	33.7	-20.3	ALL	P	SUR	1105	1	0	0.6	0.2	0.7
44624	44.0	-32.8	ALL	P	SUR	631	1	0	0.7	0.2	0.8
44625	42.1	-35.2	ALL	P	SUR	648	1	0	1.4	0.0	1.4
44627	43.2	-37.4	ALL	P	SUR	589	3	1	1.4	-0.3	1.5
44721	33.5	-31.2	ALL	P	SUR	680	0	0	1.0	0.2	1.0
44723	47.5	-41.8	ALL	P	SUR	1086	8	1	1.9	0.8	2.0
44726	59.7	-37.7	ALL	P	SUR	1330	2	0	1.4	0.1	1.4
44728	52.4	-40.8	ALL	P	SUR	985	8	1	1.9	0.1	1.9
44729	39.3	-15.8	ALL	P	SUR	761	0	0	1.7	1.0	2.0
44730	51.9	-28.9	ALL	P	SUR	970	7	1	1.9	0.3	1.9
44742	56.4	-27.5	ALL	P	SUR	1056	4	0	1.9	-0.2	1.9
44743	58.7	-37.8	ALL	P	SUR	940	20	2	2.5	-1.2	2.8
44763	45.5	-46.3	ALL	P	SUR	624	8	1	1.8	0.2	1.8
44764	50.3	-43.7	ALL	P	SUR	310	0	0	0.9	-0.3	1.0
44766	45.0	-48.3	ALL	P	SUR	246	0	0	0.9	-0.4	1.0
44771	61.3	-8.1	ALL	P	SUR	423	0	0	1.5	0.1	1.5
44775	29.8	-35.4	ALL	P	SUR	645	0	0	0.6	-0.6	0.8
44778	47.5	-15.6	ALL	P	SUR	840	0	0	0.9	0.1	0.9
44779	54.2	-41.3	ALL	P	SUR	540	9	2	1.9	-0.8	2.0
44807	43.5	-70.1	ALL	P	SUR	1	0	0	0.0	-2.2	2.2
44811	41.1	-66.6	ALL	P	SUR	1	0	0	0.0	-1.3	1.3
44825	40.3	-73.2	ALL	P	SUR	2	0	0	0.1	-1.3	1.3
44843	58.9	-38.5	ALL	P	SUR	1	0	0	0.0	3.3	3.3
44876	62.5	-0.5	ALL	P	SUR	1	0	0	0.0	-1.1	1.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
45730	52.2	-27.5	ALL	P	SUR	1	0	0	0.0	0.4	0.4
45739	43.4	-79.4	ALL	P	SUR	1	0	0	0.0	1.9	1.9
46805	42.2	-59.1	ALL	P	SUR	1	1	100			
47556	66.4	-62.2	ALL	P	SUR	355	0	0	1.8	0.3	1.8
49779	54.7	-48.1	ALL	P	SUR	1	0	0	0.0	-1.0	1.0
52803	49.9	-2.9	ALL	P	SUR	1	0	0	0.0	1.5	1.5
54552	63.1	-29.7	ALL	P	SUR	1	0	0	0.0	4.0	4.0
61598	59.9	-14.3	ALL	P	SUR	1	0	0	0.0	-3.0	3.0
61802	48.5	-5.6	ALL	P	SUR	1	0	0	0.0	-5.5	5.5
62501	32.9	-26.2	ALL	P	SUR	674	0	0	0.6	0.1	0.6
62503	32.8	-18.1	ALL	P	SUR	677	0	0	1.0	-0.5	1.1
62504	37.7	-19.2	ALL	P	SUR	649	0	0	0.5	0.0	0.5
62512	44.1	-16.8	ALL	P	SUR	765	1	0	2.1	0.6	2.1
62516	47.9	-14.1	ALL	P	SUR	779	5	1	1.5	-0.1	1.5
62518	39.6	-13.9	ALL	P	SUR	1115	0	0	1.1	-0.2	1.1
62520	59.8	-14.9	ALL	P	SUR	462	0	0	1.3	-0.2	1.3
62529	48.7	-12.4	ALL	P	SUR	1	0	0	0.0	0.8	0.8
62584	36.9	-19.5	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
62598	59.9	-14.5	ALL	P	SUR	641	3	0	1.6	-1.0	1.9
62694	54.2	-28.3	ALL	P	SUR	875	8	1	1.7	0.6	1.8
62695	55.8	-15.9	ALL	P	SUR	869	0	0	1.3	-0.1	1.3
62696	50.1	-23.0	ALL	P	SUR	811	5	1	1.5	0.0	1.5
62697	50.5	-27.1	ALL	P	SUR	855	11	1	1.8	-0.2	1.8
62698	50.6	-27.1	ALL	P	SUR	1	0	0	0.0	0.4	0.4
62708	53.8	-19.4	ALL	P	SUR	2	0	0	0.4	-0.6	0.8
62709	57.0	0.0	ALL	P	SUR	1	0	0	0.0	0.0	0.0
62717	57.9	0.0	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
62763	47.5	-8.4	ALL	P	SUR	1	0	0	0.0	-0.2	0.2
62807	45.2	-5.0	ALL	P	SUR	1	0	0	0.0	0.9	0.9
62838	58.3	-1.7	ALL	P	SUR	1	0	0	0.0	-3.0	3.0
62918	39.0	-14.5	ALL	P	SUR	1	0	0	0.0	0.4	0.4
63661	78.4	-10.2	ALL	P	SUR	266	1	0	1.1	0.2	1.1
64549	54.6	-50.0	ALL	P	SUR	568	19	3	2.8	-1.2	3.1
64551	54.5	-53.6	ALL	P	SUR	71	5	7	2.1	-0.5	2.1
64552	61.8	-30.4	ALL	P	SUR	943	1	0	1.9	-0.2	1.9
64845	59.1	-11.4	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
64846	60.6	-5.2	ALL	P	SUR	1	0	0	0.0	-1.4	1.4
65502	62.2	-4.6	ALL	P	SUR	1	0	0	0.0	0.2	0.2
65581	61.8	-6.8	ALL	P	SUR	3	2	67	0.0	-4.7	4.7
65595	62.3	-17.8	ALL	P	SUR	1317	7	1	1.3	-0.4	1.4
67696	49.8	-23.5	ALL	P	SUR	1	0	0	0.0	5.0	5.0
WIND SPEED											
106019	19.7	-83.5	ALL	SPEED	SUR	2	0	0	1.7	4.2	4.5
258015	26.2	-79.1	ALL	SPEED	SUR	1	0	0	0.0	4.0	4.0
278018	26.0	-78.1	ALL	SPEED	SUR	1	0	0	0.0	1.1	1.1
41523	30.1	-45.1	ALL	SPEED	SUR	289	8	3	5.2	-1.0	5.3
41552	20.6	-50.2	ALL	SPEED	SUR	576	0	0	1.5	-0.7	1.6
41554	22.2	-69.6	ALL	SPEED	SUR	574	0	0	2.2	0.6	2.3
41556	14.7	-67.6	ALL	SPEED	SUR	558	1	0	1.7	0.5	1.7
41557	20.2	-64.0	ALL	SPEED	SUR	572	0	0	1.7	0.0	1.7
41559	19.9	-62.2	ALL	SPEED	SUR	558	0	0	1.9	0.9	2.1
41560	17.7	-56.3	ALL	SPEED	SUR	565	0	0	1.5	0.6	1.6
41561	20.5	-54.6	ALL	SPEED	SUR	537	0	0	1.5	0.2	1.5
41563	18.8	-45.6	ALL	SPEED	SUR	571	0	0	1.5	0.2	1.5
41645	30.5	-77.9	ALL	SPEED	SUR	587	4	1	2.7	1.2	3.0
41646	27.8	-77.7	ALL	SPEED	SUR	216	0	0	3.2	-4.9	5.8
41647	25.0	-73.5	ALL	SPEED	SUR	551	1	0	2.2	1.0	2.5

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
41648	27.8	-73.2	ALL	SPEED	SUR	581	1	0	2.0	0.8	2.1
41652	28.5	-63.4	ALL	SPEED	SUR	553	3	1	2.2	0.0	2.2
44811	41.1	-66.6	ALL	SPEED	SUR	1	0	0	0.0	-1.9	1.9
44825	40.3	-73.2	ALL	SPEED	SUR	2	0	0	2.6	2.0	3.2
52803	49.9	-2.9	ALL	SPEED	SUR	1	0	0	0.0	0.1	0.1
61802	48.5	-5.6	ALL	SPEED	SUR	1	0	0	0.0	2.4	2.4
62520	59.8	-14.9	ALL	SPEED	SUR	459	3	1	4.5	-0.2	4.5
62529	48.7	-12.4	ALL	SPEED	SUR	1	0	0	0.0	-1.5	1.5
62708	53.8	-19.4	ALL	SPEED	SUR	2	0	0	0.1	-2.1	2.1
62709	57.0	0.0	ALL	SPEED	SUR	1	0	0	0.0	-0.6	0.6
62717	57.9	0.0	ALL	SPEED	SUR	1	0	0	0.0	1.0	1.0
62763	47.5	-8.4	ALL	SPEED	SUR	1	0	0	0.0	-1.8	1.8
62807	45.2	-5.0	ALL	SPEED	SUR	1	0	0	0.0	-0.2	0.2
62838	58.3	-1.7	ALL	SPEED	SUR	1	0	0	0.0	3.9	3.9
64846	60.6	-5.2	ALL	SPEED	SUR	1	0	0	0.0	-0.5	0.5
WIND DIRECTION											
106019	19.7	-83.5	ALL	DIRN.	SUR	1	0	0	0.0	13.5	13.5
258015	26.2	-79.1	ALL	DIRN.	SUR	1	0	0	0.0	10.4	10.4
278018	26.0	-78.1	ALL	DIRN.	SUR	1	0	0	0.0	-21.4	21.4
41523	30.1	-45.1	ALL	DIRN.	SUR	116	8	7	75.5	-31.6	81.9
41552	20.6	-50.2	ALL	DIRN.	SUR	443	0	0	14.8	-3.7	15.3
41554	22.2	-69.6	ALL	DIRN.	SUR	459	0	0	17.0	-3.1	17.3
41556	14.7	-67.6	ALL	DIRN.	SUR	542	1	0	14.7	1.7	14.8
41557	20.2	-64.0	ALL	DIRN.	SUR	418	0	0	15.6	-5.9	16.7
41559	19.9	-62.2	ALL	DIRN.	SUR	435	0	0	15.1	-0.3	15.1
41560	17.7	-56.3	ALL	DIRN.	SUR	442	0	0	11.6	14.2	18.4
41561	20.5	-54.6	ALL	DIRN.	SUR	390	0	0	16.0	-3.6	16.4
41563	18.8	-45.6	ALL	DIRN.	SUR	458	0	0	13.7	-5.1	14.7
41645	30.5	-77.9	ALL	DIRN.	SUR	423	4	1	21.4	4.6	21.8
41646	27.8	-77.7	ALL	DIRN.	SUR	1	0	0	0.0	-5.6	5.6
41647	25.0	-73.5	ALL	DIRN.	SUR	345	1	0	16.5	-7.7	18.2
41648	27.8	-73.2	ALL	DIRN.	SUR	429	1	0	32.0	13.9	34.9
41652	28.5	-63.4	ALL	DIRN.	SUR	348	3	1	17.6	-4.8	18.3
44811	41.1	-66.6	ALL	DIRN.	SUR	1	0	0	0.0	-4.8	4.8
44825	40.3	-73.2	ALL	DIRN.	SUR	1	0	0	0.0	-16.0	16.0
52803	49.9	-2.9	ALL	DIRN.	SUR	1	0	0	0.0	-10.7	10.7
61802	48.5	-5.6	ALL	DIRN.	SUR	1	0	0	0.0	26.6	26.6
62520	59.8	-14.9	ALL	DIRN.	SUR	413	3	1	20.4	4.5	20.9
62529	48.7	-12.4	ALL	DIRN.	SUR	1	0	0	0.0	-16.8	16.8
62708	53.8	-19.4	ALL	DIRN.	SUR	2	0	0	3.1	10.9	11.3
62717	57.9	0.0	ALL	DIRN.	SUR	1	0	0	0.0	9.7	9.7
62763	47.5	-8.4	ALL	DIRN.	SUR	1	0	0	0.0	10.5	10.5
62838	58.3	-1.7	ALL	DIRN.	SUR	1	0	0	0.0	8.4	8.4
64846	60.6	-5.2	ALL	DIRN.	SUR	1	0	0	0.0	-12.1	12.1

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures:

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored :N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	1084	1	7	1.8	0.1	1065	0	6	0	7.4	0.1
ACA	1103	0	4	1.6	-0.2	1102	0	4	0	6.3	0.6
AEA	133	2	3	1.7	0.1	134	0	1	0	7.7	0.6
AEL	378	1	13	1.8	-1.0	382	0	13	0	7.9	-0.3
AEY	92	0	4	2.2	1.2	93	1	5	0	7.7	0.4
AFL	361	2	5	1.8	0.4	363	1	4	0	7.5	0.8
AFR	871	1	10	1.6	0.0	892	1	11	0	6.9	0.4
AIC	20	0	15	2.9	0.0	21	0	14	0	10.6	-0.5
AIH	197	0	4	1.9	-0.5	195	0	5	0	9.9	1.2
AJM	113	0	2	1.5	-0.2	113	1	2	0	5.8	1.1
AMM	60	2	15	1.2	0.4	64	0	61	0	8.8	0.2
AMX	179	2	8	2.0	-0.1	179	0	8	0	10.8	-0.5
AVA	25	0	0	1.5	0.2	25	0	0	0	7.3	0.4
AZA	439	0	6	2.1	-0.2	445	2	5	0	8.1	0.5
BAL	125	1	15	1.5	-0.1	125	0	14	0	7.2	-0.3
BAW	631	0	8	1.8	-0.7	641	0	8	0	7.1	1.0
BWA	53	0	4	2.2	1.6	54	0	9	0	9.3	-0.1
CFC	27	0	7	1.9	0.6	27	0	7	0	7.3	0.1
CFG	417	0	2	1.7	-0.7	422	0	2	0	7.5	0.4
CLX	295	0	1	1.5	-0.7	300	1	2	0	6.4	0.3
COA	165	1	8	1.8	-0.5	158	1	11	0	9.8	0.6
CRL	377	1	4	1.6	0.2	379	0	6	0	9.2	0.3
CUB	69	1	6	2.5	1.5	72	0	6	0	12.2	-1.5
DAL	936	1	17	1.7	-0.6	944	0	17	0	8.7	0.2
DCE	96	2	15	1.2	0.4	102	0	15	0	7.6	-0.3
DLH	947	1	12	1.5	0.0	968	0	12	0	6.6	1.1
EDW	35	3	11	1.3	-0.2	35	0	11	0	8.2	1.3
EEZ	60	0	13	1.7	0.5	61	0	16	0	6.8	0.2
EIA	180	2	8	1.8	-0.1	179	0	100	0	19.5	5.1
EIN	31	0	6	2.3	-0.7	31	0	0	0	7.8	2.5
ELY	86	0	6	1.8	0.2	89	0	6	0	7.4	1.3
ETH	32	0	13	1.6	-0.4	36	0	14	0	5.6	-0.7
EWW	113	0	2	1.6	0.2	116	0	3	0	9.9	0.6
FDX	648	1	41	1.6	0.2	667	1	40	0	7.9	1.2
FIN	248	0	1	1.4	0.2	246	0	2	0	6.6	1.2
GAF	40	3	3	1.3	-0.6	40	0	0	0	4.4	1.0
GCO	125	2	6	1.9	-0.2	124	1	100	0	17.5	4.4
GRL	25	0	0	1.4	-0.1	25	0	0	0	5.4	2.2
GTI	259	0	9	2.0	0.2	255	1	8	0	7.6	1.3
IBE	965	0	9	1.7	0.5	957	0	11	0	7.7	0.8
ICE	693	0	1	1.4	-0.1	689	0	3	0	6.4	0.8
JKK	23	0	4	1.6	-0.1	22	0	14	0	12.1	0.7
KLM	1025	0	5	1.7	-0.1	1037	0	6	0	8.0	1.0
LDA	36	0	6	1.4	-0.4	36	0	6	0	6.4	1.5
LDI	270	1	37	2.6	-0.1	277	0	5	0	8.5	-0.2
LIB	377	2	12	1.5	0.6	381	1	12	0	7.2	1.2
LOT	123	1	6	2.2	-1.4	123	0	4	0	6.1	1.0
LTU	331	0	8	1.5	0.0	329	0	9	0	7.8	0.4
MON	100	0	3	1.3	-0.1	102	0	6	0	8.5	1.1
MPD	89	0	4	1.5	-0.4	89	0	4	0	7.0	0.7
MPH	333	0	3	1.8	-0.7	342	0	2	0	6.2	0.2
NCA	33	0	0	1.7	0.2	32	0	0	0	6.1	-0.1
NWA	2408	0	2	1.6	0.3	2423	0	2	0	6.8	0.8
PAC	106	1	8	2.1	-0.7	106	1	10	0	8.5	0.1
RCH	319	1	100	2.1	0.4	323	0	100	0	14.6	1.3
RJA	23	4	4	1.5	-0.3	24	0	0	0	6.8	1.2
RRR	24	8	13	1.1	0.1	24	0	17	0	17.4	2.4
RZO	39	0	100	2.8	-0.4	39	0	10	0	13.5	2.9
SLR	124	1	12	1.5	0.2	129	0	13	0	7.9	-0.4

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
SVA	63	3	10	2.0	0.3	70	0	9	0	8.5	0.1
SWR	69	0	4	1.5	-0.1	72	0	6	0	8.7	2.3
TAP	227	0	3	1.5	-0.4	227	0	5	0	7.9	0.1
TPA	26	0	4	1.3	0.7	25	0	4	0	7.7	-3.0
TSC	27	0	0	1.1	-0.2	28	0	0	0	4.8	0.0
UAL	305	1	100	2.2	-1.3	320	1	100	0	8.3	0.9
UPS	1040	0	41	1.8	0.0	1050	0	41	0	8.2	0.6
USA	154	1	4	1.5	-0.1	141	0	4	0	8.1	0.5
VIR	365	0	3	1.7	0.0	379	1	4	0	6.6	1.0
WOA	138	1	6	1.4	0.5	139	1	15	0	10.4	2.3
EU	22600	0	25	1.4	0.0	22600	0	23	0	4.9	0.6
KL	1008	0	6	1.4	0.6	1003	0	6	0	6.0	1.4
TN	22	5	14	2.0	0.6	22	0	9	0	8.0	-0.2
N	269	2	5	2.0	0.3	275	0	6	0	8.3	0.8
US ACARS	22180	13	36	1.5	0.2	22179	0	25	0	5.7	0.9

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	100	17	0	48.1	58.4	33.1
ELML7	12	Z	100	20	0	12.5	33.7	31.3
FNOR	00	Z	100	10	0	19.0	20.0	6.5
FNOR	12	Z	100	10	0	18.4	34.8	29.5
FNOU	00	Z	100	9	0	12.8	24.5	20.9
FNOU	12	Z	100	8	0	12.9	19.2	14.3
FNPH	00	Z	100	6	0	10.0	29.1	27.3
FNPH	12	Z	100	7	0	14.7	34.3	31.0
FNRS	00	Z	100	10	0	9.8	24.5	22.5
FNRS	12	Z	100	11	0	11.9	23.7	20.5
LDWR	00	Z	100	27	0	11.8	19.1	-15.0
LDWR	12	Z	100	27	0	11.2	16.6	-12.3
OVYA2	00	Z	100	2	0	12.5	26.6	-23.5
OVYA2	12	Z	100	3	0	6.2	20.6	-19.7
OXTS2	00	Z	100	7	0	20.0	23.0	-11.4
OXTS2	12	Z	100	3	0	12.5	22.5	-18.7
SWJS	00	Z	100	1	0	0.0	97.0	97.0
V2XO	00	Z	100	3	0	14.1	27.9	-24.0
V2XO	12	Z	100	6	0	13.9	23.0	-18.3
WPKD	00	Z	100	5	0	53.9	69.9	44.4
WPKD	12	Z	100	4	0	57.2	99.4	81.3
ZCBP6	00	Z	100	6	0	6.8	13.1	11.2
ZCBP6	12	Z	100	6	0	18.3	25.8	18.2
03953	00	Z	100	22	0	18.5	25.1	16.9
03953	12	Z	100	26	0	18.9	32.2	26.1
04018	00	Z	100	27	0	13.1	13.7	4.3
04018	12	Z	100	27	0	15.6	15.8	2.5
04220	00	Z	100	23	0	10.1	14.1	-9.9
04220	12	Z	100	25	0	9.9	17.3	-14.2
04270	00	Z	100	24	0	16.5	19.9	-11.1
04270	12	Z	100	26	0	21.3	26.1	-15.1
04339	00	Z	100	24	0	9.8	10.6	-4.0
04339	12	Z	100	25	0	13.8	15.9	-7.8
04360	00	Z	100	23	0	33.2	33.2	2.0
04360	12	Z	100	25	0	12.6	18.6	-13.7
08001	00	Z	100	25	0	27.1	27.2	2.6
08001	12	Z	100	25	1	17.7	17.8	1.9
08508	00	Z	100	12	0	13.3	22.8	18.6
08508	12	Z	100	26	0	18.0	34.5	29.5
08522	00	Z	100	25	0	8.8	25.2	23.6
08522	12	Z	100	28	0	10.5	29.8	27.9
08594	12	Z	100	17	0	16.3	37.3	33.6
60020	00	Z	100	24	0	9.6	29.7	28.1
60020	12	Z	100	27	0	14.4	30.0	26.4
71600	00	Z	100	26	0	22.1	23.3	-7.5
71600	12	Z	100	28	0	18.5	20.3	-8.4
72201	00	Z	100	27	0	35.3	51.4	37.3
72201	12	Z	100	28	0	29.1	42.3	30.6
72402	00	Z	100	26	0	13.4	31.7	28.7
72402	12	Z	100	28	0	9.5	23.9	22.0
74494	00	Z	100	24	0	11.5	15.4	10.2
74494	12	Z	100	28	0	10.1	11.9	-6.3
78016	00	Z	100	1	0	0.0	42.0	42.0
78016	12	Z	100	23	0	17.6	33.8	28.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS                NUM    NUM
IDENT TIME ELM   LEV     OBS   GROSS       SD      RMS     BIAS

ALML7  12   Z    500      1      0        0.0     16.0     16.0
ELML7  00   Z    500     18      1        6.1      7.4      4.1
ELML7  12   Z    500     21      0        5.4      7.9      5.7
FNOR   00   Z    500     10      0        9.4     10.7     -5.2
FNOR   12   Z    500     12      0        9.1     11.0      6.2

FNOU   00   Z    500      9      0        3.8      5.3      3.7
FNOU   12   Z    500     10      0        3.3      8.7      8.1
FNPH   00   Z    500     10      0        9.4     13.3      9.5
FNPH   12   Z    500      9      0       11.9     13.2      5.8
FNRS   00   Z    500     10      0        6.8      8.0      4.3

FNRS   12   Z    500     13      0        7.6     10.0      6.6
LDWR   00   Z    500     27      0       10.0     10.2     -2.0
LDWR   12   Z    500     27      0       13.0     13.4     -3.6
OVYA2  00   Z    500      2      0        1.0     13.0    -13.0
OVYA2  12   Z    500      3      0        6.2      7.9     -5.0

OXTS2  00   Z    500      7      0       13.8     14.5      4.7
OXTS2  12   Z    500      4      0       16.8     20.7     12.0
SWJS   00   Z    500      1      0        0.0     84.0     84.0
V2XO   00   Z    500      3      0       16.4     18.6     -8.7
V2XO   12   Z    500      6      0       10.1     16.5    -13.0

WPKD   00   Z    500      5      0       55.7     63.4     30.4
WPKD   12   Z    500      3      1       31.0     42.7     29.3
ZCBP6  00   Z    500      6      0        5.1      7.1      4.8
ZCBP6  12   Z    500      6      0        8.2     11.2      7.7
03953  00   Z    500     27      0       11.6     16.9     12.3

03953  12   Z    500     28      0       15.5     22.7     16.6
04018  00   Z    500     27      0       11.3     12.8      6.1
04018  12   Z    500     28      0       12.4     14.3      7.1
04220  00   Z    500     23      0       10.9     11.0     -0.5
04220  12   Z    500     25      0        9.4      9.6     -1.9

04270  00   Z    500     24      0        8.8     10.2      5.2
04270  12   Z    500     26      0       15.9     16.8      5.5
04339  00   Z    500     24      0        9.3     10.2      4.3
04339  12   Z    500     25      0        8.5      9.7      4.6
04360  00   Z    500     22      1       10.0     10.1      0.6

04360  12   Z    500     25      0       14.8     14.9     -0.7
08001  00   Z    500     25      0       17.7     17.8      1.7
08001  12   Z    500     26      1       11.6     12.0      2.8
08508  00   Z    500     12      0       10.9     11.4      3.2
08508  12   Z    500     27      0       10.3     11.8      5.9

08522  00   Z    500     27      0        7.3      8.7      4.6
08522  12   Z    500     28      0        9.3     13.4      9.7
08594  12   Z    500     22      0        6.6      6.6      0.7
60020  00   Z    500     24      0        9.6     12.2      7.5
60020  12   Z    500     27      0       12.2     15.5      9.6

71600  00   Z    500     27      0       13.1     14.9     -7.1
71600  12   Z    500     28      0       14.1     14.2     -2.2
72201  00   Z    500     27      0        7.0     13.7     11.7
72201  12   Z    500     28      0        6.2      9.5      7.1
72402  00   Z    500     27      0        5.8      9.6      7.7

72402  12   Z    500     28      0        6.5      7.5      3.7
74494  00   Z    500     26      0        6.0      6.9      3.3
74494  12   Z    500     28      0        7.9      7.9     -0.6
78016  00   Z    500      1      0        0.0     13.0     13.0
78016  12   Z    500     25      0       11.2     15.7     10.9
```

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	100	15	0	0	7.1	0.3	-1.3
ELML7	12	V	100	18	0	0	4.7	-0.5	0.7
FNOR	00	V	100	10	0	0	4.2	1.1	-0.3
FNOR	12	V	100	9	0	0	6.3	0.0	-1.0
FNOU	00	V	100	5	1	0	3.5	1.7	1.7
FNOU	12	V	100	6	0	0	3.9	0.0	-2.0
FNPH	00	V	100	5	0	0	3.6	0.0	0.6
FNPH	12	V	100	7	0	0	4.0	0.1	2.0
FNRS	00	V	100	7	0	0	4.1	-0.8	1.9
FNRS	12	V	100	8	0	0	3.9	0.8	0.0
LDWR	00	V	100	27	0	0	3.6	1.3	-0.6
LDWR	12	V	100	27	0	0	3.9	0.2	-1.5
OVYA2	00	V	100	2	0	0	4.2	1.7	3.0
OVYA2	12	V	100	3	0	0	5.5	0.5	-1.0
OXTS2	00	V	100	7	0	0	5.4	4.1	-0.1
OXTS2	12	V	100	2	0	0	5.2	-3.7	2.1
SWJS	00	V	100	1	0	0	6.5	-5.7	-3.1
V2XO	00	V	100	3	0	0	2.8	-0.7	1.4
V2XO	12	V	100	6	0	0	2.4	0.1	0.1
WPKD	00	V	100	4	0	0	6.8	-3.0	-2.7
WPKD	12	V	100	4	0	0	4.6	0.0	-0.5
ZCBP6	00	V	100	6	0	0	3.2	2.0	0.0
ZCBP6	12	V	100	4	0	0	4.2	1.6	-2.0
03953	00	V	100	21	0	0	3.7	0.5	0.3
03953	12	V	100	25	0	0	3.6	-0.6	1.0
04018	00	V	100	26	0	0	3.5	-1.0	-0.5
04018	12	V	100	26	0	0	3.3	0.8	-0.9
04220	00	V	100	23	0	0	4.0	-0.3	0.5
04220	12	V	100	25	0	0	3.6	-0.6	-0.4
04270	00	V	100	24	0	8	7.6	-1.9	0.6
04270	12	V	100	26	0	7	7.8	-0.4	-0.4
04339	00	V	100	22	0	0	4.7	1.1	-0.5
04339	12	V	100	25	0	0	4.0	1.2	0.0
04360	00	V	100	23	0	0	3.4	0.1	0.2
04360	12	V	100	25	0	0	4.2	0.9	0.6
08001	00	V	100	25	0	0	5.1	2.4	0.3
08001	12	V	100	26	0	0	5.0	-0.6	-0.2
08508	00	V	100	6	0	0	6.1	1.2	-0.1
08508	12	V	100	15	0	0	5.1	0.9	1.3
08522	00	V	100	25	0	0	4.8	0.5	0.1
08522	12	V	100	28	0	0	4.8	-0.1	-0.2
08594	12	V	100	16	0	93	5.5	0.0	3.7
60020	00	V	100	23	0	0	5.4	1.5	-0.4
60020	12	V	100	27	0	0	5.0	-0.2	0.4
71600	00	V	100	24	0	0	5.2	-0.7	0.1
71600	12	V	100	26	0	0	4.4	1.3	0.2
72201	00	V	100	27	0	0	3.9	1.3	-0.2
72201	12	V	100	28	0	0	4.0	0.1	-0.4
72402	00	V	100	26	0	0	3.7	0.5	0.0
72402	12	V	100	28	0	0	4.6	1.5	1.2
74494	00	V	100	21	0	100	4.2	-0.5	0.5
74494	12	V	100	27	0	100	3.7	-0.1	0.6
78016	00	V	100	1	0	0	3.2	-3.1	-0.6
78016	12	V	100	23	0	0	5.8	1.8	1.5

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: February 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ALML7	12	V	500	1	0	0	3.0	2.5	1.6
ELML7	00	V	500	17	0	5	7.2	-1.0	1.8
ELML7	12	V	500	21	0	0	4.3	0.6	-0.2
FNOR	00	V	500	9	0	0	5.3	0.3	0.8
FNOR	12	V	500	11	0	0	4.2	-0.6	0.1
FNOU	00	V	500	6	0	0	3.8	1.1	-1.3
FNOU	12	V	500	8	0	0	3.7	-0.7	-0.8
FNPH	00	V	500	5	0	0	3.3	1.3	-0.6
FNPH	12	V	500	7	0	0	3.5	0.0	-1.2
FNRS	00	V	500	6	0	0	3.2	-0.5	-1.6
FNRS	12	V	500	8	0	0	4.4	-0.2	1.1
LDWR	00	V	500	27	0	3	7.3	0.7	2.0
LDWR	12	V	500	26	0	0	4.3	-0.2	0.0
OVYA2	00	V	500	2	0	0	8.7	5.5	-3.3
OVYA2	12	V	500	3	0	0	6.5	4.6	2.0
OXTS2	00	V	500	7	0	0	6.2	-1.7	-2.7
OXTS2	12	V	500	4	0	0	7.1	-2.6	2.0
SWJS	00	V	500	1	0	0	0.7	-0.5	-0.5
V2XO	00	V	500	3	0	0	4.3	-0.5	1.3
V2XO	12	V	500	6	0	0	4.2	-0.6	-0.9
WPKD	00	V	500	5	0	0	3.5	0.1	1.2
WPKD	12	V	500	4	0	0	1.6	0.2	0.7
ZCBP6	00	V	500	4	0	0	3.7	2.1	-2.0
ZCBP6	12	V	500	4	0	0	4.3	0.6	0.7
03953	00	V	500	26	0	0	5.8	-0.1	-0.6
03953	12	V	500	27	0	0	5.9	1.5	1.1
04018	00	V	500	27	0	0	5.6	0.7	0.5
04018	12	V	500	28	0	3	5.0	0.8	-0.7
04220	00	V	500	23	0	0	4.8	-1.3	2.0
04220	12	V	500	25	0	0	4.4	0.9	0.5
04270	00	V	500	24	0	0	5.1	0.5	-1.6
04270	12	V	500	26	0	0	6.1	0.2	-1.4
04339	00	V	500	24	0	0	6.8	2.4	-2.2
04339	12	V	500	24	0	0	6.4	1.4	0.8
04360	00	V	500	23	0	0	6.2	-1.8	1.4
04360	12	V	500	24	0	0	6.1	0.0	1.5
08001	00	V	500	25	0	0	4.0	1.1	1.0
08001	12	V	500	27	0	0	4.4	0.8	0.2
08508	00	V	500	6	0	0	4.7	1.3	0.1
08508	12	V	500	18	0	0	4.1	0.0	1.2
08522	00	V	500	27	0	0	3.9	0.1	0.5
08522	12	V	500	28	0	0	4.0	-0.1	0.6
08594	12	V	500	23	0	95	5.9	-1.4	0.0
60020	00	V	500	24	0	0	4.1	-1.0	1.9
60020	12	V	500	23	0	0	4.6	-0.6	1.1
71600	00	V	500	27	0	0	6.1	0.1	0.7
71600	12	V	500	28	0	0	5.7	-0.3	1.7
72201	00	V	500	27	0	0	3.1	0.9	0.0
72201	12	V	500	28	0	0	4.7	-0.3	-0.5
72402	00	V	500	27	0	0	3.8	0.8	-0.1
72402	12	V	500	28	0	0	4.2	0.2	-0.6
74494	00	V	500	26	0	100	4.8	-2.0	-0.2
74494	12	V	500	28	0	100	4.0	-1.5	1.6
78016	00	V	500	1	0	0	1.7	-1.7	0.0
78016	12	V	500	25	0	0	3.7	0.0	0.7

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45